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ABSTRACT

Part 1 describes a followup study of the effects of three types of beginning reading programs on reading achievement of second graders predicted by pretests as likely to have difficulty learning to read. Forty first-grade classrooms participated, 10 classes for each treatment. All treatment A classes received instruction using the basal program. Treatment B also used the basal program, but the low subgroup children received three additional half-hour instruction sessions from remedial reading teachers using the basal materials. Treatment C low subgroup children used Houghton Mifflin readiness materials and trade books instead of the basal materials used by the rest of the class. Treatment D low subgroup children received a combination program of treatments B and C. This study compared those second graders who received the experimental program in both grades 1 and 2 with children who received only the experimental treatment in grade 1 and with children who received only basal program instruction. It was concluded that no significant difference between treatment groups was found. Part 2 analyzes only the performance of the low subgroup children, finding significant differences favoring the use of Houghton Mifflin readiness materials, followed by reading trade books, over the basal program. Extensive tables and lists of materials and tests are included. (CM)

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PART I:

A FOLLOW-UP STUDY IN GRADE 2 of PUPILS WHO RECEIVED SPECIAL INSTRUCTION IN GRADE 1 UNDER PROJECT 2702

PART II:

A STUDY OF GRADE 1 PUPILS, REPLICATING PARTS OF PROJECT 2702 AND ADDING A NEW VARIABLE

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COOPERATIVE RESEARCH PROJECT 3101

Massachusetts State Department of Education, Boston,
Massachusetts, in cooperation with the Springfield
Public Schools, Springfield, Massachusetts

Project Director: Olive S. Niles

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RE002 468

TABLE OF CONTENTS

Page

Acknowledgments i

List of Tables ii

Part 1

The Problem 1

Null Hypotheses 3

Procedures 5

Analysis of Data 29

Limitations of the Study 73

Conclusions and Implications 74

Part 2

The Problem 76

Null Hypotheses 76

Procedures 77

Analysis of Data 98

Limitations of the Study 117

Conclusions and Implications 118

Appendix

A. Related Research 120

B. Teaching Materials 127

C. Tests Used in Study 138

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LIST OF TABLES

Part 1

Table Page

1. Mean and Range of Class Size of Three Treatment Groups in Part I. 6

2. Number of Children in Each Treatment Group with Amount of Attrition in Each Group 7

3. Mean and Standard Deviation of Chronological Age in the Three Treatment Groups 8

4. Sex of Children in the Three Total Treatment Groups 8

5. Sex of Children in the Low Subgroups within the Three Total Treatment Groups 9

6. Number of Classrooms in Each Treatment Group Selected from Each of the Eight Rank Order Groupings of Schools 10

7. Comparison of Mean Scores of Total Treatment Groups on the Pintner-Cunningham Primary Test 11

8. Comparison of Mean Scores of Total Treatment Groups on the Stanford Achievement Test, Primary I, Paragraph Meaning, Administered in September 12

9. Comparison of Mean Scores of Total Treatment Groups on the Stanford Achievement Test, Primary I, Word Study Skills, Administered in September 13

10. Comparison of Mean Scores of Low Subgroups on the Pintner-Cunningham Primary Test Administered in September 14

11. Comparison of Mean Scores of Low Subgroups on the Stanford Achievement Test, Primary I, Paragraph Meaning, Administered in September 15

12. Comparison of Mean Scores of Low Subgroups on the Stanford Achievement Test, Primary I, Word Study Skills, Administered in September 16

13. Comparison of Groups within the Low Subgroups Who Had Different Experimental Programs during Project 2702 - Pintner-Cunningham Primary Test Administered in September 17

14. Comparison of Groups within the Low Subgroups Who Had Different Experimental Programs during Project 2702 - Stanford Achievement Test, Primary I, Paragraph Meaning, Administered in September 18

15. Comparison of Groups within the Low Subgroups Who Had Different Experimental Programs during Project 2702 - Stanford Achievement Test, Primary I, Word Study Skills, Administered in September 19

16. Percentage of Attendance during the Experimental Period of Children in Each Total Treatment Group 20

17. Percentage of Attendance during the Experimental Period of Children in Low Subgroups within the Total Treatment Groups 21

18. Experience and Initial Competency Rating for Teachers in Each Treatment Group 22

19. Mean Ratings of Teacher Competency Made by Supervisors in May 23

20. Mean Raw Scores of Total Treatment Groups on the Stanford Achievement Test, Primary I, Word Reading and Vocabulary 25

21. Mean Raw Scores of Low Subgroups within the Total Treatment Groups on the Stanford Achievement Test, Primary I, Word Reading and Vocabulary 25

22. Comparison of Mean Raw Scores of Total Treatment Groups on the Stanford Word Meaning Subtest Given in June 30

23. Comparison of Mean Raw Scores of Total Treatment Groups on the Stanford Paragraph Meaning Subtest 31

24. Comparison of Mean Raw Scores of Total Treatment Groups on the Stanford Word Study Skills Subtest 32

25. Comparison of Mean Scores of Total Treatment Groups on the San Diego Attitude Inventory 33

26. Comparison of Mean Scores of Children in Low Subgroups within the Total Treatment Groups on the Stanford Word Meaning Subtest 34

27. Comparison of Mean Scores of Children in Low Subgroups within the Total Treatment Groups on the Stanford Paragraph Meaning Subtest 35

28. Comparison of Mean Scores of Children in Low Subgroups within the Total Treatment Groups on the Stanford Word Study Skills Subtest 36

29. Comparison of Mean Scores of Children in Low Subgroups within the Total Treatment Groups on the San Diego Attitude Inventory 37

30. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Y (Separated According to Their Treatment in Project 2702) on the Stanford Word Meaning Subtest 38

31. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Y (Separated According to Their Treatment in Project 2702) on the Stanford Paragraph Meaning Subtest 39

32. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Y (Separated According to Their Treatment in Project 2702) on the Stanford Word Study Skills Subtest 40

33. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Y (Separated According to Their Treatment in Project 2702) on the San Diego Attitude Inventory 41

34. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Stanford Word Meaning Subtest 42

35. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Stanford Paragraph Meaning Subtest 43

36. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Stanford Word Study Skills Subtest 44

37. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the San Diego Attitude Inventory 45

38. Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Their Treatment in Project 2702) on the Stanford Word Meaning Subtest 46

39. Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Their Treatment in Project 2702) on the Stanford Paragraph Meaning Subtest 47

40. Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Their Treatment in Project 2702) on the Stanford Word Study Skills Subtest 48

41. Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Treatment in Project 2702) on the San Diego Attitude Inventory 49

42. Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Stanford Word Meaning Subtest 50

43. Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Stanford Paragraph Meaning Subtest 51

44. Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Stanford Word Study Skills Subtest 52

45. Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the San Diego Attitude Inventory 53

46. Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Stanford Word Meaning Subtest 55

47. Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Stanford Paragraph Meaning Subtest 56

48. Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Stanford Word Study Skills Subtest 57

49. Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the San Diego Attitude Inventory 58

50. Comparison of Low Subgroups within the Total Treatment Groups on the Fry Word Pronunciation Test 59

51. Comparison of Low Subgroups within the Total Treatment Groups on the Gates Word Pronunciation Test 60

52. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups of Treatment Y (Separated According to Their Treatment in Project 2702) on the Fry Word Pronunciation Test 61

53. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups of Treatment Y (Separated According to Their Treatment in Project 2702) on the Gates Word Pronunciation Test 62

54. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Fry Word Pronunciation Test 63

55. Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Gates Word Pronunciation Test 64

56. Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Treatment in Project 2702) on the Fry Word Pronunciation Test 65

57. Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Treatment in Project 2702) on the Gates Word Pronunciation Test 66

58. Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Fry Word Pronunciation Test 67

59. Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Gates Word Pronunciation Test 68

60. Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Fry Word Pronunciation Test 69

61. Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Gates Word Pronunciation Test 70

62. Tabulation of Results of June Testing in All Groups 71

63. Number of Children Not Identified at the Beginning of Grade 1 as Likely to Have Difficulty in Learning to Read Who Developed Such Difficulty by the End of Grade 2 73

Part 2

64. Mean and Range of Class Size in Three Treatment Groups 78

65. Number of Children in Each Treatment Group with Amount of Attrition in Each Group 79

66. Comparison of Chronological Age of the Total Treatment Groups 80

67. Sex of Children in the Total Treatment Groups 81

68. Sex of Children in the Low Subgroups within the Total Treatment Groups 81

69. Number of Classrooms in Each Treatment Group Selected from Each of the Eight Rank Order Groupings 82

70. Comparison of Mean Scores of Total Treatment Groups on the Pintner-Cunningham Primary Test 83

71. Comparison of Mean Scores of Total Treatment Groups on the Murphy-Durrell Phonemes Subtest 84

72. Comparison of Mean Scores of Total Treatment Groups on the Murphy-Durrell Letter Names Subtest 85

73. Comparison of Mean Scores of Total Treatment Groups on the McKee Pre-Reading Inventory: Using Context 86

74. Comparison of Mean Scores of Low Subgroups within the Total Treatment Groups on the Pintner-Cunningham Primary Test 87

75. Comparison of Mean Scores of Low Subgroups within the Total Treatment Groups on the Murphy-Durrell Phonemes Subtest 88

76. Comparison of Mean Scores of Low Subgroups within the Total Treatment Groups on the Murphy-Durrell Letter Names Subtest 89

77. Comparison of Mean Scores of Low Subgroups within the Total Treatment Groups on the McKee Pre-Reading Inventory: Using Context 90

78. Percentage of School Attendance during the Experimental Period of Children in Each Total Treatment Group 91

79. Percentage of School Attendance during the Experimental Period of Children in the Low Subgroups within the Total Treatment Groups 91

80. Experience and Initial Competency Rating for Teachers in in Each Treatment Group 92

81. Mean Ratings of Teacher Competency by Supervisors 93

82. Comparison of the Mean Scores of the Low Subgroups on the Murphy-Durrell Phonemes Subtest Administered in September and January 98

83. Comparison of the Mean Scores of the Low Subgroups on the Murphy-Durrell Letter Names Subtest Administered in September and January 99

84. Comparison of Mean Scores of Low Subgroups on the Murphy-Durrell Learning Rate Subtest Administered in September and January 100

85. Comparison of Mean Scores of Low Subgroups on the Stanford Word Reading Subtest 102

86. Comparison of Mean Scores of Low Subgroups on the Stanford Paragraph Meaning Subtest 103

87. Comparison of Mean Scores of Low Subgroups on the Stanford Vocabulary Subtest 104

88. Comparison of Mean Scores of Low Subgroups on the Stanford Spelling Subtest 105

89. Comparison of Mean Scores of Low Subgroups on the Stanford Word Study Skills Subtest 106

90. Comparison of Mean Scores of Low Subgroups on the Adaptation of the San Diego Inventory 107

91. Comparison of Mean Scores of Total Treatment Groups on the Stanford Word Reading Subtest 108

92. Comparison of Mean Scores of Total Treatment Groups on the Stanford Paragraph Meaning Subtest 109

93. Comparison of Mean Scores of Total Treatment Groups on the Stanford Vocabulary Subtest 110

94. Comparison of Mean Scores of Total Treatment Groups on the Stanford Spelling Subtest 111

95. Comparison of Mean Scores of Total Treatment Groups on the Stanford Word Study Skills Subtest 112

96. Comparison of Mean Scores of Total Treatment Groups on the Adaptation of the San Diego Inventory 113

97. Comparison of Mean Scores of Low Subgroups on the Fry Word Pronunciation Test 114

98. Comparison of Mean Scores of Low Subgroups on Informal Test of Ability to Use the Houghton Mifflin Word Attack Method 115

99. Number and Percent of Children Not Identified at the Beginning of Grade 1 as Likely to Have Difficulty in Learning to Read Who Developed Such Difficulty by the End of Grade 1 116

100. Tabulation of Results of Selected Final Tests in All Groups 118

PART I

THE PROBLEM

Part I of the study is an attempt to evaluate three types of program offered to children in grade 2 who had had, in 1964-65 under Cooperative Research Project 2702, a special program designed to teach reading more effectively to first-grade children likely to have difficulty in learning to read.

In Project 2702, procedures used with the four treatment groups were as follows:

> Treatment A. The ten classrooms in Treatment A were used as controls. All children in these classes were taught with the regular basal program which had been used in their schools for several years prior to the experimental period: Scott, Foresman (50's edition) or Ginn (1961 edition). Every effort was made to see that their program was "normal" in all respects. The "low subgroups" (children selected on the basis of tests as being most likely to have difficulty in learning to read) simply took the basal program more slowly than the more able groups. Teachers were asked to follow the manuals and to introduce nothing unusual into their teaching.
>
> Treatment B. The ten classrooms in Treatment B used the same materials and procedures as in Treatment A. However, children in the "low subgroup" in each of these classrooms were given three half-hour additional teaching periods each week. This additional direct pupil-teacher contact was provided by two teachers specially

trained in remedial reading who traveled from school to school to do this type of teaching. The traveling teachers worked on the same word and other skills which the classroom teachers of these groups were working on, and there was a close team-teacher relationship between the classroom teachers and the traveling teachers. Time for this extra pupil-teacher contact was taken from the pupils' independent reading activities time. Their total time for reading was the same as that of other children in their rooms and in the total study.

Treatment C. Children in the "low subgroups" in these ten classrooms used different materials. Other children in these classrooms worked with their regular basal materials (Scott, Foresman or Ginn). The "low subgroups" were given intensive and prolonged training with the Houghton Mifflin readiness materials (Getting Ready to Read with its accompanying teaching devices: the basic card set, the plastic objects and boxes, and the Letto cards). When the children had achieved a firm mastery of the context-first consonant attack on words, which is the essence of the Houghton Mifflin procedure, they were introduced to a series of trade books, of which they read as many as time permitted. Trade books were used in an attempt to give children materials of greater intrinsic interest than basal readers so that they might put a greater amount of energy into working with them. The trade books were used in place of basal materials for group instruction in the "low subgroups." Teachers were trained to apply the Houghton Mifflin context-first consonant approach to words introduced in the trade books.

Treatment D. The ten classrooms in Treatment D were given a combination of the procedures described under Treatments B and C. In the D classrooms, as in Treatment C, children not assigned to the "low subgroups" were given the regular basal program of their school.

The relative effectiveness of these four treatments on children in the "low subgroups" and also on children in the total class groups was examined at the end of grade one and is described in the final report of Project 2702. The problem in Part I of Project 3101 was to determine what differences, if any, exist among the following groups:

1. Children who had the regular Springfield basal program in both grade 1 and grade 2.
2. Children who had special materials and procedures in grade 1 (Project 2702) but who followed the regular Springfield basal program in grade 2. The question is: To what extent do the various experimental methods used in Project 2702 affect performance in grade 2 without additional special work in grade 2?
3. Children who had special materials and procedures in grade 1 (Project 2702) and who continued to have special materials and procedures in grade 2. The question is: How does continued work in grade 2 with special materials and procedures affect the performance of children who have had special materials and procedures in grade 1?

NULL HYPOTHESES

1. There is no significant difference in the distribution of

reading test scores at the end of grade 2 among the "low subgroups" within the total treatment groups.

2. There is no significant difference in the distribution of reading test scores at the end of grade 2 among the three treatment groups taken as wholes.

3. There is no significant difference in the distribution of reading test scores at the end of grade 2 among the children who came into the second grade from the low subgroups of the three experimental groups in Project 2702.

PROCEDURES

Locale of the Study

Springfield, Massachusetts, has a population of 174,463 (1960 census). This study was conducted in the public elementary schools of the city. Since the elementary schools are mainly neighborhood schools, certain schools are located in economically more favored areas than others.

The range of median income is from $3001-$4000 in the neighborhood of three of the schools to $7001-$8000 in the neighborhood of other schools. The range in median number of school years completed by adults is from nine years in one neighborhood to 12.5 years in another.

Springfield is mainly industrial. There is one large insurance company and several smaller ones. The city has several colleges located in or near it. The public library system is excellent. There is also a large museum complex containing historical, science, and art museums. The city has forum and concert series and an outstanding adult education program which serves about 5000 people during any one enrollment period and offers courses in some 125 different subjects.

At the time of the study, no elementary school had a central school library. Small classroom libraries were available.

Pupil Population of Part I

There are 38 public elementary schools in Springfield. Twenty-five of these were involved in Part I of Project 3101. Of the schools not involved, two are very small schools, two were using a basal series different from all the other schools in the city, three were involved in bussing to other schools which complicated the makeup of the pupil population, and two had only combination grades. The remaining four were eliminated to keep the socio-economic balance among the groups as nearly equal as possible.

Among the twenty-five schools, there are 56 second grade classes (combination grade classes not included). The largest number in any one school is four; the smallest, one. Mean class size and range of class size for each treatment group in Part I of the study is shown in Table 1. Class size is based on enrollment as of October 1, 1965. The rather wide range is accounted for mainly by a deliberate policy of keeping pupil-teacher ratio as low as possible in schools where socially handicapped children predominate.

TABLE 1

Mean and Range of Class Size for Three Treatment Groups in Part I

Group	Mean	Range
X	30.9	25 - 36
Y	31.4	21 - 34
Z	30.0	21 - 36

Membership in second grades is mainly heterogeneous. Children of all levels of ability are usually found within each second grade class. Individual differences are cared for by subgrouping within the classroom.

Table 2 shows the number of children in each treatment group with the amount of attrition during the school year. Children who were repeating grade two were not used in the study. Also, only those children who had been involved in the first-grade study (Project 2702) and who maintained the same relative position in their groups (i.e., in "low subgroups" or not) were used in the study. Because of adhering to these standards and also because of the high percentage of pupil mobility within the city, numbers were cut sharply.

TABLE 2

Number of Children in Each Treatment Group with Amount of Attrition in Each Group

		Attrition				
Group	Initial Enrollment	Group Placement changed from grade 1 placement	Not used in grade 1 study *	Moved to another school	Grade 2 repeater	Incomplete test data
X	288	43	68	36	12	11
Y	286	42	84	32	12	0
Z	275	33	64	21	13	0

* Includes children who were grade 1 repeaters and therefore not used in Project 2702

Table 3 shows the mean and standard deviation of the chronological age (in months, as of October 1, 1965) of children in each of the three treatment groups.

TABLE 3

Mean and Standard Deviation of Chronological Age in the Three Treatment Groups

Group	N	Mean	S.D.
X	118	85.68	3.61
Y	116	85.58	3.49
Z	144	86.94	3.90

Sex of children is summarized in Tables 4 and 5.

TABLE 4

Sex of Children in the Three Total Treatment Groups

Group	Boys	Girls
X	55	63
Y	53	63
Z	79	65

TABLE 5

Sex of Children in the Low Subgroups within the Three Total Treatment Groups

Group	Boys	Girls
X	19	18
Y	20	15
Z	28	16

The chance survival of a larger percentage of boys in Group Z than in either of the other groups may be significant.

Because the elementary schools of Springfield are neighborhood schools with socio-economic variations (as noted above) in the different neighborhoods, it was necessary to find some objective means of subdividing the total number of classrooms into the various treatment groups.

Since citywide testing of pupils in first or second grade has not been a practice in Springfield, it was necessary to equate schools on the basis of results from citywide testing in grades three and five, the assumption being that differences among second grade groups could be estimated from differences in grades 3 and 5. Therefore, schools were placed in rank order distributions on the basis of the California Test of Mental Maturity and the reading comprehension subtest of the Iowa

Test of Basic Skills in grades 3 and 5 for the year 1963-64. An average of the four rankings (third and fifth grade IQ; third and fifth grade reading comprehension)was used to subdivide the schools into eight groups.

Table 6 summarizes this process as it relates to Part I.

TABLE 6

Number of Classrooms in Each Treatment Group Selected from Each of the Eight Rank Order Groupings of Schools

Rank Order Groupings *	Group X	Group Y	Group Z
1	1	0	1
2	2	2	2
3	1	1	2
4	1	2	1
5	1	1	0
6	1	1	1
7	1	1	2
8	1	1	0

*Groups of schools are listed in descending order of ability and achievement.

Comparisons were made to determine whether this process of grouping schools was successful in equalizing the three treatment groups in terms of intelligence and reading ability. Tables 7-9 summarize these data for the total treatment groups.

TABLE 7

Comparison of Mean Scores of Total Treatment Groups on the Pintner-Cunningham Primary Test

Group	N	Mean Raw Score	S. D.	Diff. of Means	C.R.
X	118	45.09	5.14		
Y	116	45.02	5.66	.07	.098
X	118	45.09	5.14		
Z	144	45.67	6.47	.58	.810
Y	116	45.02	5.66		
Z	144	45.67	6.47	.65	.859

TABLE 8

Comparison of Mean Scores of Total Treatment Groups on the Stanford Achievement Test, Primary I, Paragraph Meaning, Administered in September

Group	N	Mean Raw Score	S.D.	Diff. of Means	C.R.
X	118	18.81	9.77	2.16	1.70
Y	116	20.97	9.64		
X	118	18.81	9.77	2.40	1.94
Z	144	21.21	10.26		
Y	116	20.97	9.64	.24	.19
Z	144	21.21	10.26		

TABLE 9

Comparison of Mean Scores of Total Treatment Groups on the Stanford Achievement Test, Primary I, Word Study Skills, Administered in September

Group	N	Mean Raw Score	S.D.	Diff. of Means	C.R.
X	118	36.54	9.32		
Y	116	36.73	9.52	.19	.15
X	118	36.54	9.32		
Z	144	36.69	9.75	.15	.13
Y	116	36.73	9.52		
Z	144	36.69	9.75	.04	.03

Examination of the critical ratios in Tables 7 - 9 indicates the three total treatment groups were very closely matched in intelligence and reading ability when they were tested in September. The only differences approaching significance were those between groups X and Y and groups X and Z in paragraph meaning as measured by the Stanford Achievement Test.

Tables 10-12 summarize the same comparisons for the low subgroups within the total groups.

TABLE 10

Comparison of Mean Scores of Low Subgroups on the Pintner-Cunningham Primary Test Administered in September

Group	N	Mean Raw Score	S.D.	Diff. of Means	C.R.
X	37	41.43	5.22		
Y	35	40.05	5.35	1.38	1.09
X	37	41.43	5.22		
Z	44	41.14	7.20	.29	.21
Y	35	40.05	5.35		
Z	44	41.14	7.20	1.09	.76

TABLE 11

Comparison of Mean Scores of Low Subgroups on the Stanford Achievement Test, Primary I, Paragraph Meaning, Administered in September

Group	N	Mean Raw Score	S.D.	Diff. of Means	C.R.
X	37	9.81	3.19		
Y	35	10.74	3.45	.93	1.18
X	37	9.81	3.19		
Z	44	11.05	4.33	1.24	1.45
Y	35	10.74	3.45		
Z	44	11.05	4.33	.31	.35

TABLE 12

Comparison of Mean Scores of Low Subgroups on the Stanford Achievement Test, Primary I, Word Study Skills, Administered in September

Group	N	Mean Raw Score	S.D.	Diff. of Means	C.R.
X	37	27.05	5.25		
Y	35	26.34	6.28	.71	.52
X	37	27.05	5.25		
Z	44	27.11	6.37	.06	.05
Y	35	26.34	6.28		
Z	44	27.11	6.37	.77	.53

Examination of the critical ratios in Tables 10-12 reveals no differences significant at the five per cent level. The low subgroups within the total treatment groups appear to have been closely matched in intelligence and reading ability in September.

Because certain comparisons will be made involving the groups within the low subgroups who experienced different programs during Project 2702, additional comparisons were made as reported in Tables 13 - 15.

TABLE 13

Comparison of Groups within the Low Subgroups Who Had Different Experimental Programs during Project 2702 - Pintner-Cunningham Primary Test Administered in September

Groups	N	Mean Raw Score	S.D.	Diff. of Means	C.R.
Y-B	8	38.50	6.65		
Y-C	12	40.92	5.10	2.42	.82
Y-B	8	38.50	6.65		
Y-D	15	40.20	4.35	1.70	.62
Y-C	12	40.92	5.10		
Y-D	15	40.20	4.35	.72	.37
Z-B	13	43.85	6.39		
Z-C	14	43.00	5.21	.85	.36
Z-B	13	43.85	6.39		
Z-D	17	37.53	7.73	6.32	2.36
Z-C	14	43.00	5.21		
Z-D	17	37.53	7.73	5.47	2.27

* Children in Group Y-B came from Treatment B in Project 2702; children in Y-C from Treatment C, etc. See pages 1-2.

TABLE 14

Comparison of Groups within the Low Subgroups Who Had Different Experimental Programs during Project 2702 - Stanford Achievement Test, Primary I, Paragraph Meaning, Administered in September

Groups	N	Mean Raw Score	S.D.	Diff. of Means	C.R.
Y-B	8	11.75	3.19		
Y-C	12	10.83	4.13	.92	.53
Y-B	8	11.75	3.19		
Y-D	15	10.13	2.79	1.62	1.14
Y-C	12	10.83	4.13		
Y-D	15	10.13	2.79	.70	.48
Z-B	13	12.62	4.40		
Z-C	14	10.14	1.82	2.48	1.81
Z-B	13	12.62	4.40		
Z-D	17	10.59	5.29	2.03	1.11
Z-C	14	10.14	1.82		
Z-D	17	10.59	5.29	.45	.32

TABLE 15

Comparison of Groups within the Low Subgroups Who Had Different Experimental Programs during Project 2702 - Stanford Achievement Test, Primary I, Word Study Skills, Administered in September

Groups	N	Mean Raw Score	S.D.	Diff. of Means	C.R.
Y-B	8	24.75	3.87		
Y-C	12	27.17	7.30	2.42	.92
Y-B	8	24.75	3.87		
Y-D	15	26.53	6.25	1.78	.80
Y-C	12	27.17	7.30		
Y-D	15	26.53	6.25	.64	.23
Z-B	13	25.69	4.49		
Z-C	14	27.29	4.26	1.60	.91
Z-B	13	25.69	4.49		
Z-D	17	28.06	8.46	2.37	.95
Z-C	14	27.29	4.26		
Z-D	17	28.06	8.46	.77	.32

Tables 13-15 indicate differences significant at the five per cent level between subgroups Z-B and Z-D and Z-C and Z-D on the Pintner Cunningham Test. No other differences were found to be significant at either the five or one per cent level.

Attendance of children is always an important factor in evaluating results. Tables 16 and 17 show the percentage of attendance for each treatment group.

TABLE 16

Percentage of Attendance during the Experimental Period of Children in Each Total Treatment Group

Group	N	Percentage of Attendance
X	117	93.5
Y	116	92.1
Z	144	91.1

TABLE 17

Percentage of Attendance during the Experimental Period of Children in Low Subgroups within the Total Treatment Groups

Group	N	Percentage of Attendance
X	37	93.3
Y	35	91.6
Z	44	89.9

The control group X had slightly better attendance than either of the other groups.

Teaching Staff

An attempt was made to select teachers for the study from all levels of experience and competence in each of the treatment groups. Competence was initially evaluated by principals of schools in which these teachers had worked, except in cases of beginning teachers or teachers working in Springfield for the first time, for whom no competency rating could be secured at this point. The rating scale was 4,3,2, 1 with 4 as top rating. In Table 18 a question mark is used for teachers with no competency rating.

TABLE 18

Experience and Initial Competency Rating for Teachers in Each Treatment Group

	Number in Group X	Number in Group Y	Number in Group Z
Experience			
0 years	3	0	1
1-4 years	3	4	4
5 or more	3	5	4
Competency Rating			
?	3	1	1
1	0	0	0
2	0	1	0
3	4	3	2
4	2	4	6

Inspection of Table 18 indicates that the teachers in the three groups were not closely matched. It was necessary to use teachers assigned to schools serving children who had participated in Project 2702. This resulted in teacher assignments in which both groups Y and Z had the advantage of greater experience and also higher competency ratings.

The two supervisors who worked with Project 3101 also rated the teachers in May on a five-point scale in which 5 was the high rating. These supervisor ratings are summarized in Table 19.

TABLE 19

Mean Ratings of Teacher Competency Made by Supervisors in May

Group	N	Mean Competency Rating
X	9	3.56
Y	9	4.22
Z	9	3.22

Comparison of Tables 18 and 19 indicates that supervisors did not agree with the principals in their competency ratings. Group Z was considered by these supervisors to have the lowest mean competency rating.

Preliminary Testing

As soon after the opening of school as possible, the entire population took the following tests. Tests were administered by the classroom teachers and scored in the project office.

1. Pintner-Cunningham Primary Test, Form B, Harcourt, Brace and World, 1964. This is a standardized test of intelligence.

2. Stanford Primary Reading Test I, Form X, Harcourt, Brace and World, 1964. This contains a series of subtests as follows:

   Test 1, Word Reading - a test consisting of 35 items which measures the child's ability to recognize a word without the aid of verbal context. It employs a multiple-choice type of item in which the pupil looks at a picture and then selects one word which stands for that picture out of a group of four words given.

   Test 2, Paragraph Meaning - a test of 38 items which places emphasis on comprehension of material read.

   Test 3, Vocabulary - a test which measures the child's vocabulary independent of his reading skill. Both questions and answers are read by the examiner. This test employs a multiple-choice type of item.

   Test 4, Spelling - a test that employs a dictation-type exercise in which the word to be spelled is pronounced, illustrated in a sentence, and written by the children.

   Test 5, Word Study Skills - a test which measures phonetic skill: initial sounds, final sounds, total sound of a word, and rhyming words.

The results of the Pintner Cunningham Test and of the Paragraph Meaning and Word Study Skills subtest of the Stanford have already been reported in Tables 7 - 15. These tests were used in estimating the degree of similarity among the groups. Data from the

Word Reading and Vocabulary subtests are reported in Tables 20 and 21.

TABLE 20

Mean Raw Scores of Total Treatment Groups on the Stanford Achievement Test, Primary I, Word Reading and Vocabulary

Group	N	Mean, Word Reading	Mean, Vocabulary
X	117	20.57	23.21
Y	116	21.57	23.56
Z	143	21.33	24.66

TABLE 21

Mean Raw Scores of Low Subgroups within the Total Treatment Groups on the Stanford Achievement Test, Primary I, Word Reading and Vocabulary

Group	N	Mean, Word Reading	Mean, Vocabulary
X	37	12.68	18.38
Y	35	14.26	19.34
Z	44	12.95	16.95

The Pintner-Cunningham and Stanford test results were used to place children in the intraclass groupings used in Grade 2. In general, children in the low subgroups were the low third of each total class group as measured by these tests.

Teaching Procedures

Treatment X. Children in the nine classrooms in this group were all drawn from children in the control group of Project 2702. In grade 1 they had the regular basal program (Scott, Foresman or Ginn) of the Springfield Public Schools. They continued in this type of program in grade 2. Their program was as "normal" as it was possible to make it. Children in the "low subgroups" simply took the program more slowly than the more able groups.

Treatment Y. Children in the nine classrooms in this group were drawn from the three experimental groups of Project 2702 as follows:

Y-B from groups which worked in regular basal readers in grade 1 but in which the low subgroups had three half-hour periods of extra instruction per week given by a remedial teacher (Treatment B in Project 2702)

Y-C from groups in which the low subgroups used the Houghton Mifflin readiness program followed by instruction with trade books instead of basal readers (Treatment C in Project 2702)

Y-D from groups in which the low subgroups had a combination of the materials and procedures used in Treatments B and C of Project 2702 (Treatment D in Project 2702)

All children in Y-B, Y-C, and Y-D had the regular basal program in grade 2.

Treatment Z. Children in the nine classrooms in this group were also drawn from the three experimental groups of Project 2702 as follows:

Z-B - same as Y-B
Z-C - same as Y-C
Z-D - same as Y-D

Children in the low subgroups in Z-B, Z-C, and Z-D continued to use in grade 2 special materials and procedures. The special materials used were trade books (See list in Appendix B). These trade books were used for group teaching and the Houghton Mifflin method of word attack was applied. (See sample teaching instructions for one of these books in Appendix B). (1) Children not in the low subgroups in these classrooms used the regular basal program.

The Time Factor

The school year 1965-66 was 185 days. The experimental period of 140 days started on October 13, 1965. Preliminary testing was done prior to the beginning of the experimental period. During this time teachers carried on a review and informal program.

The school day in the elementary schools of Springfield is a two-session day: 8:45 to 11:35 and 1:00 to 3:15 except on Tuesday, when the afternoon session is from 1:00 to 2:30. The school week for second grade children is 24 hours, 40 minutes.

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(1) The original proposal for Project 3101 indicated that Science Research Laboratories I and Ia would also be used as supplementary material with the low subgroups in Treatment Z. Funding of the project was not final until December, and these laboratories could not be ordered until that time. After this, delivery was delayed so long that very little use could be made of the SRA materials. They were not a factor in the instruction.

The program of studies for grade 2 specifies 310 minutes per week for reading instruction per se, 90 minutes per week for language and literature and 75 minutes per week for spelling and phonics. Teachers in all three treatment groups were asked to adhere to this time allotment as closely as possible. The instructional time included both direct teacher instruction and independent activities. The two supervisors kept as close a check as possible on the use of time by teachers in the different groups.

Supervision

All the activities of Project 3101 were supervised by Mrs. Mildred W. Lowe and Mrs. Helen F. Thayer. Both worked full time on the project. Both are qualified teachers of reading. The two supervisors held meetings with the teachers, gave demonstration lessons, advised concerning grouping, supervised the giving of the tests, evaluated teachers, and tried to control the time factor during the experiment.

ANALYSIS OF DATA

At the end of the experimental period, the following tests were given:

Stanford Primary Reading Test II, Form W, Harcourt, Brace and World, 1965. The following subtests were given:

Word Meaning - A test of word recognition in context.

Paragraph Meaning - a test with emphasis on comprehension of brief passages.

Spelling - a test in which the children write a word after hearing it pronounced and used in context.

Word Study Skills - a test of ability to match beginning sounds: consonants, blends, vowels, and syllables; and ending sounds: rhymes, blends, single consonants.

The San Diego-Attitude Inventory (See Appendix C) was also given to all students. This test attempts to measure the children's attitudes about books and reading.

All children in the low subgroups were tested additionally with the following tests. These tests were administered individually by members of the study staff or by trained reading teachers.

Fry Word Pronunciation Test - a test of pupils' ability to pronounce out of context a list of phonetically regular words.

Gates Word Pronunciation Test - a test in which children are asked to pronounce a list of graded words out of context.

The Gilmore Oral Reading Test was administered to a random sample of the total Treatment groups. Only two scores were recorded: accuracy (a test of pupils' ability to pronounce words in context) and rate. Hesitations and repetitions were not counted as errors. Hence, norms published for this test are not appropriate in this study. Types of errors checked to obtain the accuracy score were: substitutions, mispronunciations, words pronounced by examiner, disregard of punctuation, insertions, and omissions.

Data from the Stanford and the San Diego Tests for the total treatment groups are recorded in Tables 22 - 25.

TABLE 22

Comparison of Mean Raw Scores of Total Treatment Groups on the Stanford Word Meaning Subtest Given in June

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	117	18.68	6.94		
Y	116	20.44	6.73	1.76	1.975
X	117	18.68	6.94		
Z	142	19.23	6.39	.55	.657
Y	116	20.44	6.73		
Z	142	19.23	6.39	1.21	1.472

TABLE 23

Comparison of Mean Raw Scores of Total Treatment Groups on the Stanford Paragraph Meaning Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	118	31.33	11.32		
Y	116	33.45	11.40	2.12	1.428
X	118	31.33	11.32		
Z	142	32.15	11.90	.82	.568
Y	116	33.45	11.40		
Z	142	32.15	11.90	1.30	.892

TABLE 24

Comparison of Mean Raw Scores of Total Treatment Groups on the Stanford Word Study Skills Subtest

Group	N	Mean	S. D.	Diff. of Means	C.R.
X	117	37.45	11.97		
Y	115	37.12	9.56	.33	.232
X	117	37.45	11.97		
Z	143	35.16	11.70	2.29	1.551
Y	115	37.12	9.56		
Z	143	35.16	11.70	1.96	1.481

TABLE 25

Comparison of Mean Scores of Total Treatment Groups on the San Diego Attitude Inventory

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	117	19.01	4.41		
Y	110	17.56	5.57	1.45	.216
X	117	19.01	4.41		
Z	138	18.58	4.49	.43	.077
Y	110	17.56	5.57		
Z	138	18.58	4.49	1.02	.156

Inspection of Tables 22-25 shows only one significant difference among the total treatment groups. Group Y was superior at the five per cent level to group X on the Stanford Word Meaning subtest.

This study focused primarily upon the low subgroups within the total treatment groups. It was with children in these groups only that experimental materials and procedures were used. Therefore, differences, if any, are of greater significance than differences among the total treatment groups. Tables 26-29 record data showing the differences.

TABLE 26

Comparison of Mean Scores of Children in Low Subgroups within the Total Treatment Groups on the Stanford Word Meaning Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	36	11.94	4.89		
Y	35	14.54	5.51	2.60	2.070
X	36	11.94	4.89		
Z	42	11.69	4.45	.25	.231
Y	35	14.54	5.51		
Z	42	11.69	4.45	2.85	2.427

TABLE 27

Comparison of Mean Scores of Children in Low Subgroups within the Total Treatment Groups on the Stanford Paragraph Meaning Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	37	20.05	8.24		
Y	35	21.40	8.89	1.35	.659
X	37	20.05	8.24		
Z	42	19.36	8.59	.69	.359
Y	35	21.40	8.89		
Z	42	19.36	8.59	2.04	.995

TABLE 28

Comparison of Mean Scores of Children in Low Subgroups within the Total Treatment Groups on the Stanford Word Study Skills Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	37	26.35	7.58		
Y	35	29.00	6.61	2.65	1.577
X	37	26.35	7.58		
Z	42	25.02	6.54	1.33	.821
Y	35	29.00	6.61		
Z	42	25.02	6.54	3.98	2.618

TABLE 29

Comparison of Mean Scores of Children in Low Subgroups within the Total Treatment Groups on the San Diego Attitude Inventory

Group	N	Means	S.D.	Diff. of Means	C.R.
X	37	17.97	4.42		
Y	33	15.82	5.30	2.15	1.807
X	37	17.97	4.42		
Z	41	17.61	4.67	.36	.346
Y	33	15.82	5.30		
Z	41	17.61	4.67	1.79	1.492

Inspection of Tables 26-29 indicates that the low subgroups differed significantly in three respects. On the Stanford Word Meaning subtest, Group Y was significantly superior to Group X at the five per cent level of confidence, and Group Y was also superior to Group Z at the five per cent level.

On the Stanford Word Study Skills subtest, Group Y was significantly superior to Group Z at the one per cent level of confidence.

The second grade Group Y was made up of children from each of groups B, C, and D in Project 2702. Tables 30-33 summarize comparisons of the performance of children within the low subgroups of Group Y with children in the low subgroup of Group X.

TABLE 30

Comparison of Mean Scores of Children in Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Y (Separated According to Their Treatment in Project 2702) on the Stanford Word Meaning Subtest *

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	36	11.94	4.89		
Y-B	8	10.38	3.76	1.56	.951
X	36	11.94	4.89		
Y-C	12	15.67	5.43	3.73	2.038
X	36	11.94	4.89		
Y-D	15	15.87	5.22	3.93	2.426

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* See p. 17 for interpretation of symbols Y-B, Y-C, Y-D.

TABLE 31

Comparison of Mean Scores of Children in Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Y (Separated according to Their Treatment in Project 2702) on the Stanford Paragraph Meaning Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	37	20.05	8.24		
Y-B	8	14.88	7.64	5.17	1.616
X	37	20.05	8.24		
Y-C	12	22.00	6.90	1.95	.783
X	37	20.05	8.24		
Y-D	15	24.40	9.12	4.35	1.554

TABLE 32

Comparison of Mean Scores of Children in Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Y (Separated according to Their Treatment in Project 2702) on the Stanford Word Study Skills Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	37	26.35	7.58		
Y-B	8	26.50	5.22	.15	.064
X	37	26.35	7.58		
Y-C	12	26.42	4.80	.07	.036
X	37	26.35	7.58		
Y-D	15	32.40	6.97	6.05	2.689

TABLE 33

Comparison of Mean Scores of Children in Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Y (Separated according to Their Treatment in Project 2702) on the San Diego Attitude Inventory

Group	N	Mean	S.D.	Diff. of Means	C.R.
X	37	17.97	4.42		
Y-B	8	16.75	3.96	1.22	.731
X	37	17.97	4.42		
Y-C	12	15.00	6.24	2.97	1.470
X	37	17.97	4.42		
Y-D	13	16.15	4.45	1.82	1.230

Attrition had reduced the numbers in groups Y-B, Y-C, and Y-D to such an extent that results of these comparisons may not be reliable. However, it would appear that the Y-C and Y-D groups both were significantly (5% level) superior to the control group on the Stanford Word Meaning subtest and that Y-D was significantly superior to the control group at the 1% level on the Word Study Skills subtest.

Similar comparisons between the control group and groups Z-B, Z-C and Z-D are reported in Tables 34-37.

TABLE 34

Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Stanford Word Meaning Subtest *

Group	N	Means	S.D.	Diff. of Means	C.R.
X	36	11.94	4.89		
Z-B	13	11.31	3.68	.63	.467
X	36	11.94	4.89		
Z-C	13	10.54	3.25	1.40	1.120
X	36	11.94	4.89		
Z-D	16	12.94	5.43	1.00	.613

* See p.17 for explanation of symbols Z-B, Z-C, Z-D.

TABLE 35

Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Stanford Paragraph Meaning Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
X	37	20.05	8.24		
Z-B	13	20.23	8.66	.18	.063
X	37	20.05	8.24		
Z-C	13	16.92	7.09	3.13	1.272
X	37	20.05	8.24		
Z-D	16	20.63	9.21	.58	.211

TABLE 36

Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Stanford Word Study Skills Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
X Z-B	37 13	26.35 25.31	7.58 5.47	1.04	.515
X Z-C	37 13	26.35 25.85	7.58 6.72	.50	.216
X Z-D	37 16	26.35 24.13	7.58 6.98	2.22	1.014

TABLE 37

Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the San Diego Attitude Inventory

Group	N	Means	S.D.	Diff. of Means	C.R.
X	37	17.97	4.42		
Z-B	12	19.50	3.28	1.53	1.234
X	37	17.97	4.42		
Z-C	13	16.15	4.42	1.82	1.230
X	37	17.97	4.42		
Z-D	16	17.38	5.24	.59	.383

No significant differences appear between the control subgroup (X) and any of the Z subgroups on any of the subtests of the Stanford or on the San Diego Attitude Inventory.

Also important are differences among the low subgroups within the major subgroups in each total treatment group. The data for these comparisons are recorded in Tables 38-45.

TABLE 38

Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Their Treatment in Project 2702) on the Stanford Word Meaning Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	10.38	3.76		
Y-C	12	15.67	5.43	5.29	2.438
Y-B	8	10.38	3.76		
Y-D	15	15.87	5.22	5.49	2.759
Y-C	12	15.67	5.43		
Y-D	15	15.87	5.22	.20	.093

TABLE 39

Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Treatment in Project 2702) on the Stanford Paragraph Meaning Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	14.88	7.64		
Y-C	12	22.00	6.90	7.12	2.000
Y-B	8	14.88	7.64		
Y-D	15	24.40	9.12	9.52	2.519
Y-C	12	22.00	6.90		
Y-D	15	24.40	9.12	2.40	.748

TABLE 40

Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Treatment in Project 2702) on the Stanford Word Study Skills Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	26.50	5.22		
Y-C	12	26.42	4.80	.08	.033
Y-B	8	26.50	5.22		
Y-D	15	32.40	6.97	5.90	2.177
Y-C	12	26.42	4.80		
Y-D	15	32.40	6.97	5.98	2.534

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TABLE 41

Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Treatment in Project 2702) on the San Diego Attitude Inventory

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	16.75	3.96		
Y-C	12	15.00	6.24	1.75	.726
Y-B	8	16.75	3.96		
Y-D	13	16.15	4.45	.60	.305
Y-C	12	15.00	6.24		
Y-D	13	16.15	4.45	1.15	.507

TABLE 42

Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Stanford Word Meaning Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Z-B	13	11.31	3.68		
Z-C	13	10.54	3.25	.77	.546
Z-B	13	11.31	3.68		
Z-D	16	12.94	5.43	1.63	.926
Z-C	13	10.54	3.25		
Z-D	16	12.94	5.43	2.40	1.420

TABLE 43

Comparison of Mean Scores of Children in the Low Subgroups within Major Subgroup Z (Separated According to Treatment in Project 2702) on the Stanford Paragraph Meaning Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Z-B	13	20.23	8.66		
Z-C	13	16.92	7.09	3.31	1.025
Z-B	13	20.23	8.66		
Z-D	16	20.63	9.21	.40	.116
Z-C	13	16.92	7.09		
Z-D	16	20.63	9.21	3.71	1.182

TABLE 44

Comparison of Mean Scores of Children in the Low Subgroups Within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Stanford Word Study Skills Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Z-B	13	25.31	5.47		
Z-C	13	25.85	6.72	.54	.216
Z-B	13	25.31	5.47		
Z-D	16	24.13	6.98	1.18	.492
Z-C	13	25.85	6.72		
Z-D	16	24.13	6.98	1.72	.649

TABLE 45

Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the San Diego Attitude Inventory

Group	N	Means	S.D.	Diff. of Means	C.R.
Z-B	12	19.50	3.28		
Z-C	13	16.15	4.42	3.35	2.068
Z-B	12	19.50	3.28		
Z-D	16	17.38	5.24	2.12	1.269
Z-C	13	16.15	4.42		
Z-D	16	17.38	5.24	1.23	.661

Inspection of Tables 38-45 reveals significant differences as follows:

Y-C superior to Y-B on the Word Meaning subtest at the 5% level

Y-D superior to Y-B on the Word Meaning subtest at the 1% level

Y-C superior to Y-B on the Paragraph Meaning subtest at the 5% level

Y-D superior to Y-B on the Paragraph Meaning subtest at the 5% level

Y-D superior to Y-B on the Word Study Skills subtest at the 5% level

Y-D superior to Y-C on the Word Study Skills subtest at the 5% level

Z-B superior to Z-C on the San Diego Inventory at the 5% level

This list of significant differences would seem to indicate that, in general, children who had the regular program in grade 2 (Group Y) but had different materials and procedures in grade 1 (Y-C) or a combination of these different materials and procedures with extra teacher help (Y-D) in grade 1 were superior to children who had only extra teacher time (Y-B) in grade 1, as measured by the Stanford Test at the end of grade two. With only one exception, similar differences do not appear among the children who continued in the modified program in grade 2 (Group Z).

Comparisons were also made between the subgroups within the major subgroups Y and Z.

TABLE 46

Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Stanford Word Meaning Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	10.38	3.76		
Z-B	13	11.31	3.68	.93	.525
Y-C	12	15.67	5.43		
Z-C	13	10.54	3.25	5.13	2.714
Y-D	15	15.87	5.22		
Z-D	16	12.94	5.43	2.93	1.487

TABLE 47

Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Stanford Paragraph Meaning Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	14.88	7.64		
Z-B	13	20.23	8.66	5.35	1.401
Y-C	12	22.00	6.90		
Z-C	13	16.92	7.09	5.08	1.740
Y-D	15	24.40	9.12		
Z-D	16	20.63	9.21	3.77	1.106

TABLE 48

Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Stanford Word Study Skills Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	26.50	5.22		
Z-B	13	25.31	5.47	1.19	.470
Y-C	12	26.42	4.80		
Z-C	13	25.85	6.72	.57	.236
Y-D	15	32.40	6.97		
Z-D	16	24.13	6.98	8.27	3.193

TABLE 49

Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the San Diego Attitude Inventory

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	16.75	3.96		
Z-B	12	19.50	3.28	2.75	1.528
Y-C	12	15.00	6.24		
Z-C	13	16.15	4.42	1.15	.507
Y-D	13	16.15	4.45		
Z-D	16	17.38	5.24	1.23	.661

Only two of the comparisons reported in Tables 45-49 are significant. Y-C is superior to Z-C at the 1% level on the Stanford Word Meaning subtest. Y-D is superior to Z-D at the 1% level on the Stanford Word Study Skills subtest.

Children in the low subgroups were all tested with the Fry Word Pronunciation Test and the Gates Word Pronunciation Test. Comparisons are reported in Tables 50-61. So few children within the subgroups took the Gilmore Oral Reading Test that comparisons were not attempted.

TABLE 50

Comparison of Low Subgroups within the Total Treatment Groups on the Fry Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
X	35	11.17	10.31		
Y	34	12.21	10.81	1.04	.403
X	35	11.17	10.31		
Z	41	9.51	10.74	1.66	.678
Y	34	12.21	10.81		
Z	41	9.51	10.74	2.70	1.067

TABLE 51

Comparison of Low Subgroups within the Total Treatment Groups on the Gates Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
X	35	14.71	5.49		
Y	34	16.09	5.18	1.38	1.062
X	35	14.71	5.49		
Z	41	14.85	7.03	.14	.097
Y	34	16.09	5.18		
Z	41	14.85	7.03	1.24	.873

TABLE 52

Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups of Treatment Y (Separated According to Their Treatment in Project 2702) on the Fry Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
X	35	11.17	10.31		
Y-B	8	7.88	7.98	3.29	.940
X	35	11.17	10.31		
Y-C	12	13.92	11.61	2.75	.701
X	35	11.17	10.31		
Y-D	14	13.21	10.84	2.04	.585

TABLE 53

Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups of Treatment Y (Separated According to Their Treatment in Project 2702) on the Gates Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
X	35	14.71	5.49		
Y-B	8	14.63	3.02	.08	.054
X	35	14.71	5.49		
Y-C	12	17.00	6.66	2.29	1.032
X	35	14.71	5.49		
Y-D	14	16.14	4.48	1.43	.923

TABLE 54

Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Fry Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
X	35	11.17	10.31		
Z-B	11	12.73	11.99	1.56	.373
X	35	11.17	10.31		
Z-C	14	7.79	5.99	3.38	1.397
X	35	11.17	10.31		
Z-D	16	8.81	12.45	2.36	.643

TABLE 55

Comparison of Mean Scores of Children in the Low Subgroup in Treatment X with Children in the Low Subgroups in Treatment Z (Separated According to Their Treatment in Project 2702) on the Gates Word pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
X	35	14.71	5.49		
Z-B	11	16.00	7.21	1.29	.522
X	35	14.71	5.49		
Z-C	14	14.14	4.51	.57	.365
X	35	14.71	5.49		
Z-D	16	14.69	8.45	.02	.008

TABLE 56

Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Treatment in Project 2702) on the Fry Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	7.88	7.98		
Y-C	12	13.92	11.61	6.04	1.307
Y-B	8	7.88	7.98		
Y-D	14	13.21	10.84	5.33	1.251
Y-C	12	13.92	11.61		
Y-D	14	13.21	10.84	.71	.154

TABLE 57

Comparison of Mean Scores of Children in the Low Subgroups within the Major Y Subgroup (Separated According to Treatment in Project 2702) on the Gates Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	14.63	3.02		
Y-C	12	17.00	6.66	2.37	1.026
Y-B	8	14.63	3.02		
Y-D	14	16.14	4.48	1.51	.899
Y-C	12	17.00	6.66		
Y-D	14	16.14	4.48	.86	.364

TABLE 58

Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Fry Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
Z-B	11	12.73	11.99		
Z-C	14	7.79	5.99	4.94	1.193
Z-B	11	12.73	11.99		
Z-D	16	8.81	12.45	3.92	.790
Z-C	14	7.79	5.99		
Z-D	16	8.81	12.45	1.02	.283

TABLE 59

Comparison of Mean Scores of Children in the Low Subgroups within the Major Z Subgroup (Separated According to Treatment in Project 2702) on the Gates Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
Z-B	11	16.00	7.21		
Z-C	14	14.14	4.51	1.86	.715
Z-B	11	16.00	7.21		
Z-D	16	14.69	8.45	1.31	.416
Z-C	14	14.14	4.51		
Z-D	16	14.69	8.45	.55	.219

TABLE 60

Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Fry Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	7.88	7.98		
Z-B	11	12.73	11.99	4.85	1.000
Y-C	12	13.92	11.61		
Z-C	14	7.79	5.99	6.13	1.584
Y-D	14	13.21	10.84		
Z-D	16	8.81	12.45	4.40	1.000

TABLE 61

Comparison of Mean Scores of Children in Low Subgroups within the Major Y and Z Subgroups on the Gates Word Pronunciation Test

Group	N	Means	S.D.	Diff. of Means	C.R.
Y-B	8	14.63	3.02		
Z-B	11	16.00	7.21	1.37	.539
Y-C	12	17.00	6.66		
Z-C	14	14.14	4.51	2.86	1.212
Y-D	14	16.14	4.48		
Z-D	16	14.69	8.45	1.45	.578

Inspection of Tables 50-61 reveals no significant differences among the groups on either the Fry Word Pronunciation Test or the Gates Word Pronunciation Test.

Because so few of the differences among groups were found to be statistically significant, a tabulation was made of all comparisons to see whether any overall trend could be discerned. Groups compared are listed in the second column of Table 62. The group whose mean score was the higher of the two is indicated under the name of each test. A figure in parentheses indicates significant difference at the 5% or 1% level.

TABLE 62

Tabulation of Results of June Testing in All Groups

Item	Groups	Stanford Word Meaning	Stanford Paragraph Meaning	Stanford Word Study Skills	San Diego Attitude	Fry	Gates
1.	X and Y (total)	Y (5)	Y	X	X	—	—
2.	X and Z (total)	Z	Z	X	X	—	—
3.	Y and Z (total)	Y	Y	Y	Z	—	—
4.	X and Y (subgroups)	Y (5)	Y	Y	X	Y	Y
5.	X and Z (subgroups)	X	X	X	X	X	Z
6.	Y and Z (subgroups)	Y (5)	Y	Y (1)	Z	Y	Y
7.	X(subgroup) and Y-B	X	X	Y-B	X	X	X
8.	X(subgroup) and Y-C	Y-C (5)	Y-C	Y-C	X	Y-C	Y-C
9.	X(subgroup) and Y-D	Y-D (5)	Y-D	Y-D (1)	X	Y-D	Y-D
10.	X(subgroup) and Z-B	X	Z-B	X	Z-B	Z-B	Z-B
11.	X(subgroup) and Z-C	X	X	X	X	X	X
12.	X(subgroup) and Z-D	Z-D	Z-D	X	X	X	X
13.	Y-B and Y-C	Y-C (5)	Y-C (5)	Y-B	Y-B	Y-C	Y-C
14.	Y-B and Y-D	Y-D (1)	Y-D (5)	Y-D (5)	Y-B	Y-D	Y-D
15.	Y-C and Y-D	Y-D	Y-D	Y-D (5)	Y-D	Y-C	Y-C
16.	Z-B and Z-C	Z-B	Z-B	Z-C	Z-B (5)	Z-B	Z-B
17.	Z-B and Z-D	Z-D	Z-D	Z-B	Z-B	Z-B	Z-B
18.	Z-C and Z-D	Z-D	Z-D	Z-C	Z-D	Z-D	Z-D
19.	Y-B and Z-B	Z-B	Z-B	Y-B	Z-B	Z-B	Z-B
20.	Y-C and Z-C	Y-C(1)	Y-C	Y-C	Z-C	Y-C	Y-C
21.	Y-D and Z-D	Y-D	Y-D	Y-D (1)	Z-D	Y-D	Y-D

Even the kind of tabulation reported in Table 62 does not establish any definite trend. Since Group Z received special attention in both grades 1 and 2, it would be presumed that this group might be superior in achievement to group X (which served as the control) and group Y (which received special attention only in grade 1). This did not prove to be the case in many instances. In fact, subgroup Y surpassed subgroups X and Z in 10 of the 12 comparisons made (see items 4 and 6 in Table 62). Items 19, 20, 21 tend to favor Y groups over Z groups.

There is a tendency revealed in Table 62 for the X group (control) to have a slightly more positive attitude toward reading, as measured by the San Diego Inventory, than either of the experimental groups. This finding is in contradiction to informal observation of the enthusiasm with which children responded to the trade books.

Comparisons were made to show whether subgroup B, C, or D (Project 2702) produced superior achievement at the end of grade 2. Items 13, 14, 15 in Table 62 report 18 comparisons in which the D group seems to have a slight advantage. Items 16, 17, 18, however, indicate a similar advantage for group B.

The final check made with Part I data was concerned with this question: Were there children who, at the end of grade 2, seem to have developed problems in reading and who were not identified at the beginning of grade 1 as likely to do so? Table 63 presents the date. Scores below the 25th percentile (national norms) on the Stanford Paragraph Meaning subtest or the Stanford Word Study Skills subtest were used as cut-off points.

TABLE 63

Number of Children Not identified at the Beginning of Grade 1 as Likely to Have Difficulty in Learning to Read Who Developed Such Difficulty by the End of Grade 2

Group	Number below 25th %ile: Paragraph Meaning	Number below 25th %ile: Word Study Skills
X	6	0
Y	4	2
Z	6	6

Inspection of Table 63 seems to indicate that the screening process used at the beginning of grade 1 was an efficient one.

LIMITATIONS OF THE STUDY

The following were the chief limitations under which Part I of the study was conducted:

1. The sharp rate of attrition between the first grade study and the second grade study. This reduced numbers in some of the subgroups to such a degree that reliability of results is in question.

2. The number of boys in the Z group (where the experimental work in grade 2 was conducted) was 55%, as compared with 46% and 47% in groups X and Y respectively. In the low subgroups within the total Z group, boys made up 64% of the group, as compared with 51% and 57% in the low subgroups of X and Y respectively.
3. Comparisons of the low subgroups for matching purposes indicated that groups Z-B and Z-C were both significantly superior (5% level) on the Pintner-Cunningham Test to group Z-D.
4. The control group X had slightly better attendance than either of the experimental groups.

CONCLUSIONS AND IMPLICATIONS

It was hoped that significant differences would appear which would help to determine 1) whether certain special procedures and materials used in grade 1 produced higher achievement at the end of grade 2 than the regular basal program of the Springfield Public Schools and 2) whether continued use of such materials and procedures in grade 2 improved performance as compared with performance of children not given such continued exposure in grade 2.

While certain differences in performance do appear, a few of them apparently significant, in general the three null hypotheses stated on pp. 3-4 of this report are supported by the data. Limitations of the study (as stated), particularly the first of these, may be related to the inconclusive results but it is not possible to determine in what way or to what degree.

It seems safe to conclude that the screening process used at the beginning of grade 1 served its purpose well.

PART II

THE PROBLEM

Part II of study 3101 is a replication of parts of Project 2702. It is mainly concerned, as was Project 2702, with first grade children who have been identified as likely to have greater than usual difficulty in learning to read.

The study is concerned with examining the following:

1) Which of three procedures tested in the study is most effective in teaching children likely to have difficulty (to be designated in the study as the "low subgroups") to read? (1)

2) What, if any, differences occurred in the performance of the total group of children in the classrooms in which the three kinds of procedures were being carried out with children in the "low subgroups"?

3) What is the probability that a pupil not identified by a battery of predictive tests as likely to have greater than usual difficulty in learning to read in grade 1 will actually have such difficulty?

NULL HYPOTHESES

1) There is no significant difference in the distribution of reading test scores at the end of grade one among the "low subgroups" within the three total treatment groups.

2) There is no significant difference in the distribution of reading test scores at the end of grade one among the three total treatment groups.

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(1) The original proposal for Project 3101 called for four procedures. The fourth involved the use of listening stations. Funding for the project was not final until December, 1965. Purchase of materials for building these stations and preparation of the tapes was not possible at this date.

PROCEDURES

Locale of the Study

Springfield, Massachusetts, has a population of 174,463 (1960 census). This study was conducted in the public elementary schools of the city. Since the elementary schools are mainly neighborhood schools, certain schools are located in economically more favored areas than others.

The range of median income is from $3001-$4000 in the neighborhood of four of the schools to $7001-$8000 in the neighborhood of seven schools. The range in median number of school years completed by adults is from nine years in one neighborhood to 12.5 years in another.

Springfield is mainly industrial. There is one large insurance company and several smaller ones. The city has several colleges located in or near it. The public library system is excellent. There is also a large museum complex containing historical, science, and art museums. The city has forum and concert series and an outstanding adult education program which serves about 5000 people during any one enrollment period and offers courses in some 125 different subjects.

At the time of the study, no elementary school had a central school library. Small classroom libraries were available.

Pupil Population of Part II

Twenty-five of the 38 public elementary schools in Springfield were involved in Part II of the study. Of the schools not involved, six were eliminated because of the dropping of one experimental variable (see p. 76). Three were not used because the basal system in these schools is different from that of the rest of the city, two are very small schools, and the remaining two were eliminated because the pupil population, at the time of the study, was in a state of flux.

Among the schools involved there are 73 first grade classes, including combination first and second grades. The largest number in any one school is six; the smallest, one. Mean class size and range of class size for each treatment group is shown in Table 64. Class size is based on enrollment as of October 1, 1965.

TABLE 64

Mean and Range of Class Size in Three Treatment Groups

Group	Mean	Range
E	29.3	23 - 33
F	30.5	23 - 37
G	29.5	23 - 36

In Springfield, children may enter first grade if they are 5 years and 7 months old by September 10 of the year of entrance. Kindergartens are available in all schools in the city, and most first grade children have had kindergarten experience.

Membership in the first grade classes is heterogeneous. Principals use the child's kindergarten experience and an evaluation of his progress by his kindergarten teacher to make up the first grade groupings.

Table 65 shows the number of children in each treatment group and the amount of attrition during the school year. First grade repeaters were not used in the study.

TABLE 65

Number of Children in Each Treatment Group with Amount of Attrition in Each Group

		Attrition		
Group	Initial Enrollment	Repeating Grade 1	Moved to another school or class	Incomplete Test Data
E	293	30	34	7
F	317	30	38	4
G	296	23	39	3

Table 66 records data which compares the chronological age (in months, as of October 1, 1965) of children in each of the three treatment groups.

TABLE 66

Comparison of Chronological Age of the Total Treatment Groups

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	219	74.15	3.82		
F	245	74.01	3.47	.14	.393
E	219	74.15	3.82		
G	229	73.36	3.44	.79	2.279
F	245	74.01	3.47		
G	229	73.36	3.44	.65	2.044

The control group (E) and experimental group (F) were both significantly (5% level) older than experimental group G.

Sex of children in the study is summarized in Tables 67 and 68.

TABLE 67

Sex of Children in the Total Treatment Groups

Group	Boys	Girls
E	113 (51%)	108
F	135 (55%)	110
G	112 (49%)	117

TABLE 68

Sex of Children in the Low Subgroups within the Total Treatment Groups

Group	Boys	Girls
E	62 (61%)	39
F	73 (65%)	39
G	59 (61%)	38

The slightly higher percentage of boys as compared with girls in Treatment F should be considered in interpreting results.

The elementary schools in Springfield are neighborhood schools. As in most cities, the socio-economic environment of the different schools varies considerably. The procedure for assigning classrooms to different treatment groups was the same as for Part I - see page 9 . Table 69 summarizes this process for Part II of the study.

TABLE 69

Number of Classrooms in Each Treatment Group Selected from Each of the Eight Rank Order Groupings

Rank Order Groupings*	Treatment E	Treatment F	Treatment G
1	1	1	1
2	2	2	2
3	1	2	2
4	2	1	1
5	1	1	1
6	2	1	1
7	0	1	1
8	1	1	1

*Groups of schools are listed in descending order of ability and achievement.

Success of the procedures used to equalize the treatment groups was tested by examining selected preliminary test scores of children in each treatment group. Tables 70-73 summarize these data for the total treatment groups

TABLE 70

Group	N	Means	S.D.	Diff. of Means	C.R.
E	219	32.82	9.31		
F	245	31.81	8.58	1.01	1.210
E	219	32.82	9.31		
G	229	31.98	8.89	.84	.970
F	245	31.81	8.58		
G	229	31.98	8.89	.17	.217

TABLE 71

Comparison of Mean Scores of Total Treatment Groups on the Murphy-Durrell Phonemes Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	216	24.24	13.38		
F	239	21.66	12.75	2.58	2.100
E	216	24.24	13.38		
G	221	22.26	12.84	1.98	1.576
F	239	21.66	12.75		
G	221	22.26	12.84	.60	.503

TABLE 72

Comparison of Mean Scores of Total Treatment Groups on the Murphy-Durrell Letter Names Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	218	33.22	13.40		
F	245	31.86	13.40	1.36	1.097
E	218	33.22	13.40		
G	228	31.14	12.98	2.08	1.671
F	245	31.86	13.40		
G	228	31.14	12.98	.72	.594

TABLE 73

Comparison of Mean Scores of Total Treatment Groups on the McKee Pre-Reading Inventory: Using Context

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	193	5.93	2.10		
F	235	6.07	1.99	.14	.707
E	193	5.93	2.10		
G	217	5.60	2.18	.33	1.555
F	235	6.07	1.99		
G	217	5.60	2.18	.47	2.385

Inspection of Tables 70-73 indicates that the large groups were fairly well matched in the skills measured by these tests. However, the control group was superior to group F at the 5% level on the Murphy-Durrell Phonemes subtest, and group F surpassed group G at the 5% level on the McKee Pre-Reading Inventory: Using Context.

Equating of the low subgroups within the total treatment groups is, in this particular study, of even more importance than the equating of the total groups. Similar comparisons, therefore, were made of children in the low subgroups. Tables 74-77 record the data.

TABLE 74

Comparison of Mean Scores of Low Subgroups within the Total Treatment Groups on the Pintner Cunningham Primary Test

Group	N	Means	S.D.	Diff. of Means	C.R.
E	96	26.33	7.63		
F	109	26.61	7.72	.28	.262
E	96	26.33	7.63		
G	96	26.24	7.73	.09	.085
F	109	26.61	7.72		
G	96	26.24	7.73	.37	.347

TABLE 75

Comparison of Mean Scores of Low Subgroups within the Total Treatment Groups on the Murphy-Durrell Phonemes Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
E	93	12.56	7.87		
F	104	12.74	8.70	.18	.154
E	93	12.56	7.87		
G	88	12.56	9.01	.00	.002
F	104	12.74	8.70		
G	88	12.56	9.01	.18	.143

TABLE 76

Comparison of Mean Scores of Low Subgroups within the Total Treatment Groups on the Murphy-Durrell Letter Names Subtest

Group	N	Means	S.D.	Diff. of Means	C.R.
E	95	24.46	11.88		
F	109	22.76	10.95	1.70	1.058
E	95	24.46	11.88		
G	95	22.91	11.46	1.55	.920
F	109	22.76	10.95		
G	95	22.91	11.46	.15	.091

TABLE 77

Comparison of Mean Scores of Low Subgroups within the Total Treatment Groups on the McKee PreReading Inventory: Using Context

Group	N	Means	S.D.	Diff. of Means	C. R.
E	77	5.08	2.23		
F	100	5.29	2.12	.21	.641
E	77	5.08	2.23		
G	91	4.79	2.25	.29	.827
F	100	5.29	2.12		
G	91	4.79	2.25	.50	1.572

Data in Tables 74-77 indicate that the low subgroups among the total treatment groups were closely matched.

The low subgroups in G had worked with the Houghton Mifflin materials during the last eight weeks in their kindergarten experience. This work, apparently, did not affect test results at the beginning of grade one.

Attendance of the children is of importance, also, in evaluating results. Tables 78 and 79 show the percentage of attendance of each treatment group.

TABLE 78

Percentage of School Attendance during the Experimental Period of Children in Each Total Treatment Group

Group	N	Percentage of Attendance
E	196	92.3
F	241	91.8
G	229	92.5

TABLE 79

Percentage of School Attendance during the Experimental Period of Children in the Low Subgroups within the Total Treatment Groups

Group	N	Percentage of Attendance
E	89	91.9
F	106	91.5
G	96	92.1

The percentage of attendance varied very little from group to group.

Teaching Staff

See p. 21 for statement concerning method of assignment of teachers.

Table 80 records the experience and initial competency rating of the teachers. A question mark is used for beginning teachers with no competency rating .

TABLE 80

Experience and Initial Competency Rating for Teachers in Each Treatment Group

	Number in Group E	Number in Group F	Number in Group G
Experience			
0 years	1	0	1
1-4 years	3	6	2
5 or more	6	4	7
Competency Rating			
?	1	0	1
1	1	0	0
2	0	3	0
3	3	3	3
4	5	4	6

As a further check on the competency of the teachers, supervisors rated the teachers at the end of the year. Ratings were on a four-point scale with 4 as top rating. Table 81 summarizes the data.

TABLE 81

Mean Ratings of Teacher Competency by Supervisors

Group	Mean Rating
E	2.4
F	2.6
G	2.9

On the basis of these ratings, Group G appeared to have a slight advantage over the other groups in teacher competency and over Group F in experience of the teachers.

Preliminary Testing

The following tests were given as soon after school opened as possible. Tests were administered by classroom teachers.

1. Pintner-Cunningham Primary Test, Form A, Harcourt, Brace and

World, 1964. This is a standardized test of intelligence.

2. Murphy-Durrell Reading Readiness Analysis, Harcourt, Brace and World, 1964. This readiness test has three subtests:
    - Phonemes - a test of pupils' ability to identify separate sounds in spoken words
    - Letter Names - a test that requires identification of capital and lower case letters named by the examiner
    - Learning Rate - a test to determine the number of words a child is able to learn in one day under standardized conditions of presentation
3. McKee Pre-Reading Inventory, Part Two, Diagnostic Test, Houghton Mifflin, 1962. This is a readiness test consisting of four parts:
    - Using Context - a measure of the pupil's ability to use oral context to call to mind a word which makes sense in a certain context
    - Finding Letters - a measure of the pupil's ability to identify letter forms when the letters are named by the examiner
    - Listening for Letter Sounds - a measure of the pupil's understanding of what is meant by the beginning of a spoken word and his awareness of the fact that certain consonant sounds are used at the beginning of words
    - Matching Letters and Sounds - a measure of the pupil's knowledge of letter-sound associations for consonants
4. Visual Matching Test, unpublished - a test of child's ability to match forms, letters, and words

Raw scores from all of these tests were tabulated by classroom for each pupil in the study. From these tabulations, about one-third of the children were selected to become the "low subgroups." These were children whose total testing profiles were lowest among the children in their classrooms. No citywide cutoff points could be determined because of the wide variations in performance of children in different schools. Therefore, each classroom was studied separately and those children selected who gave evidence in their test scores of being relatively the least able within their own classrooms.

Teaching Procedures

Treatment E. The ten classrooms in Treatment E served as controls. All children were taught with the regular basal program which had been used in their schools for several years: Scott, Foresman (50's edition) or Ginn (1961 edition). Teachers were asked to follow the manuals and keep the program as "normal" as possible in every way. The "low subgroups" within the classrooms merely took the program more slowly than more able pupils. Children in the low subgroups achieving significantly less well than others in their groups were given about 20 minutes extra instruction per day by the regular remedial teacher in their school during the last half of the year.

Treatment F. In the ten groups in this treatment, children in the low subgroups were given thorough instruction with the Houghton Mifflin readiness materials (Getting Ready to Read and accompanying materials) starting in September. When they achieved success with these materials, they worked with trade books rather than basal readers using the trade books for group instruction, not individualized reading. Other children in these rooms followed the regular basal program. Children in the low subgroups achieving significantly less well than others in their groups were given about 20 minutes extra instruction per day by the regular remedial teacher in their school during the last half of the year.

Treatment G. Children in the low subgroups of Treatment G had the same program as children in Treatment F except that their work with the Houghton Mifflin readiness materials began during the last eight weeks of their kindergarten experience. Children in these low subgroups came from among the less able children in the kindergarten classes which worked with the Houghton Mifflin materials. The other children in these classrooms did not have the Houghton Mifflin readiness work either in kindergarten or first grade; they were taught with the regular basal program of their schools. Children in the low subgroups achieving significantly less well than others in their groups were given about 20 minutes extra instruction per day by the regular remedial teacher in their school during the last half of the year.

Time Factor

The school year 1965-66 was 179 days. The experimental period extended from October 18 to May 25, 1966. Prior to the beginning of the experimental period, the preliminary testing was done and the membership in the "low subgroups" within each classroom was determined. While this was being done, teachers were asked not to start any formal teaching of reading. They worked on informal readiness activities.

The school day in the elementary schools of Springfield is a two-session day: from 8:45 to 11:35 and from 1:00 to 3:15 except on Tuesday, when the afternoon session is from 1:00 to 2:30. The school week for first grade children is 24 hours, 40 minutes.

The Springfield program of studies sets forth weekly time allotments for each area of the curriculum. In first grade 425 minutes per week are assigned to the teaching of reading and phonics. An additional 75 minutes per week are assigned to language development, mainly oral.

Teachers in all three treatment groups were asked to adhere to this standard time allotment. The "reading and phonics" time allotment covered such activities as these: group instruction by the teachers in whatever materials were assigned to the treatment group and independent seatwork activities related to the group instruction.

A check was taken toward the end of the year of the teachers' adherence to this time allotment. While variations occurred, in general the teachers tried to work within the allotted time.

Supervision

Two supervisors spent full time on Project 3101, Parts I and II. Teachers of the experimental groups needed help in becoming acquainted with materials with which they were completely unfamiliar. Demonstration lessons and materials were prepared for these teachers. In the control groups, the teachers were working with basal manuals with which they were already familiar.

An effort was made to see that these teachers were doing as good a job as they were able. Professional meetings, demonstrations, and suggestions were provided also for the control teachers.

ANALYSIS OF DATA

The first testing of results occurred in January when the Murphy-Durrell Reading Readiness Analysis was readministered to children in all the "low subgroups." Tables 82-84 present the gains made between the two testing periods.

TABLE 82

Comparison of the Mean Scores of the Low Subgroups on the Murphy-Durrell Phonemes Subtest Administered in September and January

Group	N	Means	Diff. of Means
E	94	Sept. 12.10 Jan. 33.47	21.37
F	107	Sept. 12.07 Jan. 33.16	21.09
G	95	Sept. 11.52 Jan. 32.87	21.35

TABLE 83

Comparison of the Mean Scores of the Low Subgroups on the Murphy-Durrell Letter Names Subtest Administered in September and January

Group	N	Means	S.D.	Diff. of Means	C.R.
E	94	Sept. 24.31	11.42		
		Jan. 42.28	10.43	17.97	11.231
F	108	Sept. 22.74	10.95		
		Jan. 45.07	8.72	22.33	16.664
G	95	Sept. 22.58	11.60		
		Jan. 43.26	10.24	20.68	13.006

TABLE 84

Comparison of Mean Scores of Low Subgroups on the Murphy-Durrell Learning Rate Subtest Administered in September and January

Group	N	Means	S.D.	Diff. of Means	C.R.
E	94	Sept. 7.34	2.94		
		Jan. 13.32	4.15	5.98	11.500
F	107	Sept. 7.53	3.21		
		Jan. 12.58	4.07	5.05	10.100
G	94	Sept. 6.40	4.13		
		Jan. 12.13	2.84	5.73	11.019

All groups showed substantial growth on all three tests. Differences between September and January means on the Murphy-Durrell Phonemes subtest were so very nearly the same that no critical ratios were computed. Critical ratios computed for the other two tests indicate that Group F made the greatest growth on the Letter Names subtest and that Group E made slightly greater growth than either of the other groups on the Learning Rate subtest.

Analysis of Final Data

At the end of the experimental period, the following group tests were given to all children in the study:

Stanford Achievement Test, Primary 1, Form X :

Test 1, Word Reading - a test consisting of 35 items which measures the child's ability to analyse a word without the aid of verbal context. It employs a multiple-choice type of item in which the pupil looks at a picture and then selects one word which stands for that picture out of a group of four words given.

Test 2, Paragraph Meaning - a test of 38 items which places emphasis on comprehension of the material read.

Test 3, Vocabulary - a test which measures the child's vocabulary independent of his reading skill. Both questions and answers are read by the examiner. The test employs a multiple-choice type of item.

Test 4, Spelling - a test that employs a dictation-type exercise in which the word to be spelled is pronounced, illustrated in a sentence, and then written by the children.

Test 5, Word Study Skills - a test which measures phonetic skill: initial sounds, final sounds, total sound of a word, and rhyming words.

Adaptation of the San Diego Attitude Inventory. This test, consisting of 16 questions, measures a pupil's feelings about reading. Questions are read by the examiner, and the pupils respond by circling Yes or No. (See Appendix)

Children in the "low subgroups" were also tested individually with the following instruments:

Fry Word Pronunciation Test - a test of pupils' ability to pronounce out of context a list of phonetically regular words

Informal Test of Ability to Apply Houghton Mifflin Word Attack Method - a test constructed to assess pupils' ability to combine context clues and initial consonant sounds to unlock unfamiliar words.

A writing sample was also taken but not used in analysis of the study.

Tables 85-90 record the data from the group tests for the low subgroups. All mean scores are raw scores.

TABLE 85

Comparison of Mean Scores of Low Subgroups on the Stanford Word Reading Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	96	15.53	5.06		
F	109	17.23	6.64	1.70	2.072
E	96	15.53	5.06		
G	96	16.57	6.14	1.04	1.283
F	109	17.23	6.64		
G	96	16.57	6.14	.66	.735

TABLE 86

Comparison of Mean Scores of Low Subgroups on the Stanford Paragraph Meaning Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	95	14.26	5.87		
F	108	15.24	7.22	.98	1.063
E	95	14.26	5.87		
G	95	13.32	6.65	.94	1.041
F	108	15.24	7.22		
G	95	13.32	6.65	1.92	1.977

TABLE 87

Comparison of Mean Scores of Low Subgroups on the Stanford Vocabulary Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	96	16.23	4.68		
F	109	18.50	5.53	2.27	3.191
E	96	16.23	4.68		
G	95	18.39	4.97	2.16	3.091
F	109	18.50	5.53		
G	95	18.39	4.97	.11	.157

TABLE 88

Comparison of Mean Scores of Low Subgroups on the Stanford Spelling Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	88	7.78	4.82		
F	95	9.86	5.75	2.08	2.657
E	88	7.78	4.82		
G	84	7.35	4.56	.43	.614
F	95	9.86	5.75		
G	84	7.35	4.56	2.51	3.263

TABLE 89

Comparison of Mean Scores of Low Subgroups on the Stanford Word Study Skills Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	96	30.40	7.43		
F	109	33.06	9.00	2.66	2.316
E	96	30.40	7.43		
G	96	31.40	8.60	1.00	.862
F	109	33.06	9.00		
G	96	31.40	8.60	1.66	1.349

TABLE 90

Comparison of Mean Scores of Low Subgroups on the Adaptation of the San Diego Inventory

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	89	12.70	2.07		
F	98	12.79	1.96	.09	.301
E	89	12.70	2.07		
G	92	12.76	2.33	.06	.196
F	98	12.79	1.96		
G	92	12.76	2.33	.03	.079

Significant differences between subgroups as recorded in Tables 85-90 are as follows:

Group F superior to group E at the 5% level on the Stanford Word Reading subtest

Group F superior to group G at the 5% level on the Stanford Paragraph Meaning subtest

Group F superior to group E and group G superior to group E at the 1% level on the Stanford Vocabulary subtest

Group F superior to group E and also to group G at the 1% level on the Stanford Spelling subtest

Group F superior to group E at the 5% level on the Stanford Word Study Skills subtest

Even though all children other than those in the low subgroups were being taught with the regular basal materials and procedures, it seemed important to measure the effect upon the total groups of the special experimental work in the low subgroups. Tables 91-96 present the data.

TABLE 91

Comparison of Mean Scores of Total Treatment Groups on the Stanford Word Reading Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	219	19.70	6.43		
F	245	21.20	7.54	1.50	2.321
E	219	19.70	6.43		
G	229	20.14	6.93	.44	.706
F	245	21.20	7.54		
G	229	20.14	6.93	1.06	1.595

TABLE 92

Comparison of Mean Scores of Total Treatment Groups on the Stanford Paragraph Meaning Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	219	19.64	8.37		
F	244	21.45	9.39	1.81	2.194
E	219	19.64	8.37		
G	228	19.29	9.18	.81	.416
F	244	21.45	9.39		
G	228	19.29	9.18	2.16	2.522

TABLE 93

Comparison of Mean Scores of Total Treatment Groups on the Stanford Vocabulary Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	219	19.92	6.21		
F	245	22.06	6.33	2.14	3.672
E	219	19.92	6.21		
G	228	21.24	5.55	1.32	2.374
F	245	22.06	6.33		
G	228	21.24	5.55	.82	1.493

TABLE 94

Comparison of Mean Scores of Total Treatment Groups on the Stanford Spelling Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	209	11.42	5.50		
F	231	13.45	5.84	2.03	3.764
E	209	11.42	5.50		
G	216	11.18	6.97	.24	.396
F	231	13.45	5.84		
G	216	11.18	6.97	2.27	3.728

TABLE 95

Comparison of Mean Scores of Total Treatment Groups on the Stanford Word Study Skills Subtest

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	219	36.29	8.67		
F	245	38.73	9.48	2.44	2.904
E	219	36.29	8.67		
G	229	37.12	9.61	.83	.966
F	245	38.73	9.48		
G	229	37.12	9.61	1.61	1.837

TABLE 96

Comparison of Mean Scores of Total Treatment Groups on the Adaptation of the San Diego Inventory

Group	N	Mean	S.D.	Diff. of Means	C.R.
E	210	12.83	2.18		
F	230	13.04	2.13	.21	1.000
E	210	12.83	2.18		
G	218	13.07	4.75	.24	.663
F	230	13.04	2.13		
G	218	13.07	4.75	.03	.084

Inspection of Tables 91-96 reveals the following significant differences:

Group F superior to group E on the Stanford Word Reading subtest at the 5% level

Group F superior to group E and also to group G on the Stanford Paragraph Meaning subtest at the 5% level

Group F superior to group E at the 1% level and group G superior to group E at the 5% level on the Stanford Vocabulary subtest

Group F superior to group E and also to group G at the 1% level on the Stanford Spelling subtest

Group F superior to group E at the 1% level on the Stanford Word Study Skills subtest

The individual testing of pupils in the low subgroups yielded data recorded in Tables 97 and 98.

TABLE 97

Comparison of Mean Scores of Low Subgroups on the Fry Word Pronunciation Test

Group	N	Mean	S. D.	Diff. of Means	C.R.
E	22	5.55	9.67		
F	63	14.67	12.25	9.12	3.541
E	22	5.55	9.67		
G	38	7.11	7.09	1.56	.661
F	63	14.67	12.25		
G	38	7.11	7.09	7.56	3.930

TABLE 98

Comparison of Mean Scores of Low Subgroups on Informal Test of Ability to Use the Houghton Mifflin Word Attack Method

Group	N	Mean	S. D.	Diff. of Means	C.R.
E	94	6.97	2.57		
F	107	8.47	2.82	1.50	3.947
E	94	6.97	2.57		
G	94	7.79	2.84	.82	2.102
F	107	8.47	2.82		
G	94	7.79	2.84	.68	1.744

Data in Tables 97 and 98 indicate that Group F was superior to both groups E and G at the 1% level on the Fry Word Pronunciation Test. Group F was superior at the 1% level to group E on the Informal Test of Ability to Use the Houghton Mifflin Word Attack Method. Group G was also superior to group E at the 5% level on the Informal Test of Ability to Use the Houghton Mifflin Word Attack Method. It should be remembered that group E had never had specific instruction in this method.

The study was also concerned with the predictive value of the pretests. A study was made to determine how many children not identified by the predictive tests as likely to have greater than usual difficulty in learning to read actually did have such difficulty. "Greater than usual difficulty" was interpreted to mean that the pupil was reading below the 25th percentile for his grade as measured by a standardized primary reading test at the end of grade 1. Table 99 reports the results for two of the subtests of the Stanford Primary Test. Statistical data furnished with this test did not permit the use of exactly the 25th percentile as a cut-off point (see table).

TABLE 99

Number and Percent of Children Not Identified at the Beginning of Grade 1 as Likely to Have Difficulty in Learning to Read Who Developed Such Difficulty by the End of Grade 1

Group	Number below 24th %ile: Paragraph Meaning	Number below 22nd %ile: Word Study Skills
E	24 (19.5%)	3 (2.4%)
F	16 (11.7%)	4 (2.9%)
G	28 (21.1%)	4 (3.0%)

Data presented in Table 99 indicates very clearly that, so far as achievement can be reliably measured by the two subtests of the Stanford Primary Test, the predictive tests did a very good job of identifying children likely to have difficulty with word recognition and a poor job of identifying those likely to have difficulty in comprehension. The investigator has no idea as to why this is true since both parts of reading instruction (word analysis and comprehension) received strong emphasis in the instructional periods.

LIMITATIONS OF THE STUDY

Slight differences among the groups were found as follows at the beginning of the study:

- Groups E and F were chronologically older than group G (significant at the 5% level).
- Group G seemed to have slightly better qualified teachers than either of the other groups.
- Group F had a slightly higher percent of boys than either of the other groups.
- Total Group E was superior to total group F at the 5% level on the Murphy-Durrell Phonemes subtest and total group F surpassed total group G at the 5% level on the McKee Pre-Reading Inventory: Using Context. However, no significant differences appeared among the low subgroups where the experimental work was actually carried on.

None of these differences, distributed as they are among the groups, seem to represent clear limitations in the study.

One variable (the use of taped lessons) had to be eliminated completely from the study (see page 76 for explanation).

CONCLUSIONS AND IMPLICATIONS

A final table was prepared to summarize differences among the groups. Groups compared are listed in the second column of Table 100. The group whose mean score was the higher of the two is indicated under the name of each test. A figure in parentheses indicates significant difference at the 5% or 1% level. Results of the Stanford tests of Vocabulary (a measure of the child's oral, not his reading, vocabulary) and of Spelling are not included in this final tabulation since they are not directly related to the purposes of the study. It might be noted, however, that the same general pattern of superiority of group F appears in these two tests.

TABLE 100

Tabulation of Results of Selected Final Tests in All Groups

Item	Groups	Stanford Word Reading	Stanford Paragraph Meaning	Stanford Word Study Skills	Adaptation of San Diego	Fry	Informal (Houghton Mifflin)
1.	E and F (subgroups)	F (5)	F	F (5)	F	F (1)	F (1)
2.	E and G (subgroups)	G	E	G	G	G	G (5)
3.	F and G (subgroups)	F	F (5)	F	F	F (1)	F
4.	E and F (total)	F (5)	F (5)	F (1)	F	—	—
5.	E and G (total)	G	E	G	G	—	—
6.	F and G (total)	F	F (5)	F	G	—	—

Table 100 makes it clear that group F surpassed both the control group E and experimental group G in all but one of the comparisons made between group F and either group E or group G. Many of the differences were significant differences. In comparisons between the control group and group G, group G surpassed the control group in all but two comparisons, but in only one case was the difference significant.

The following conclusions may be tentatively drawn from the facts in Table 100:

1. The work done with the Houghton Mifflin materials and the trade books was more effective than that done with the basal readers. It would appear that adequate training in the Houghton Mifflin method for unlocking strange printed words makes rigid vocabulary control unnecessary in grade 1.

2. At least with this group of children, it was more effective to start this work at the beginning of grade 1 than in kindergarten. It should be recalled that when the children who started the work in kindergarten were selected for the first grade groups they were the children who had done least well with the Houghton Mifflin work in their respective kindergarten groups. At the beginning of the year, tests did not indicate that their work in kindergarten had given them any significant headstart as compared with children in the other groups. Also they were significantly younger chronologically (5% level) than either the control group or group F. Therefore, it should not be concluded that starting the Houghton Mifflin readiness program in kindergarten with other more able, or older children would be similarly ineffective.

APPENDIX A

RELATED RESEARCH

Project 3101 is a follow-up to Project 2702. Research reported in relation to the earlier project is still relevant but will not be repeated in this report. The reader is referred to the final report of Project 2702. Research related to those parts of the follow-up study which differ from procedures in Project 2702 is included in the following summary.

Since Project 3101 was a follow-up study intended to measure some of the effects upon children in grade two who had participated in the earlier project while they were in grade one, a search was made for any similar follow-up studies. A few follow-up studies were located. Examples are the ITA experiments, the Cyrog (1) and Johnson (2) studies of individualized reading, and the Durkin (3) studies of early readers. Longitudinal studies, however, seem to be comparatively rare in the literature, and none was found which dealt with procedures similar to those in the present study. It was noted that such a study, continued through grade five, is currently being conducted in Denver. This study involves use of the Houghton Mifflin materials but not some of the other components of the present study. At this date only preliminary results have been published.

Readiness Tests

Certain tests, particularly those involving auditory discrimination and knowledge of letter names, have been fairly well established as instruments for predicting success in first grade reading. (4) (5)

Silvaroli (6) found that a measure of letter identification was the single factor most predictive of first grade reading success. However, only two studies were found to show the relationship of reading success in grade two and later grades to performance on these tests.

Kingston (7) studied the relationship of beginning first grade readiness test scores to third- and fourth-grade scholastic achievement. He used the Metropolitan Readiness Tests and the Stanford Achievement Tests in his study. The findings were as follows:

1. First grade Metropolitan Readiness scores correlated significantly with achievement in all areas measured by the Stanford at both third- and fourth-grade level.
2. The magnitude of the correlation coefficients (between .30 and .60) indicated that the tests are not adequate for predicting achievement of individual pupils.
3. The matching and number tests of the Metropolitan correlate to a greater degree with later achievement than do other tests in the Metropolitan Readiness battery.

Karlin (8) correlated first grade Metropolitan scores with a third grade reading test and obtained a coefficient of .36. When chronological age and intelligence factors were eliminated, the coefficient dropped to .25.

Trade Books

Although authorities in the field frequently stress the failure of basal readers to meet the motivational needs of children (9) (10), and, partly because of this alleged failure, there has been a good deal of research on the subject of the effectiveness of trade books in individualized reading, no reports were found of the use of trade books for group instruction as in the present study.

Formal Readiness in Kindergarten

A new experimental factor was introduced in Part II of the present study: readiness work in kindergarten in one of the experimental groups.

The question as to whether any formal readiness or teaching of reading reading - the two kinds of instruction are not always clearly differentiated in the literature - should be a part of kindergarten instruction is vigorously debated. It is opposed by many authorities who argue that the short attention span and the physical, social, and mental immaturity of five-year-olds should preclude formal instruction (11), (12), (13).

Clymer (14) reports a study of current opinion concerning systematic teaching of reading readiness in kindergarten. A national survey directed to principals, kindergarten teachers, first grade teachers, and consultants in 180 communities with populations of 20,000 and above resulted in the following findings:

"1. Classroom teachers favor systematic instruction in readiness to a much greater degree than do supervisors and consultants.

2. Principals' attitudes toward readiness instruction in the kindergarten are more similar to the attitudes of teachers than to those of consultants and supervisors.

3. Most of the schools reporting have readiness instruction in the kindergarten.

4. Many kindergarten teachers tend to see readiness instruction as a classwide activity, while first grade teachers tend to see it as instruction in small groups within the class.

5. Instructional materials in order of preference are: 1) teacher-made picture charts, 2) teacher-prepared games and recordings, 3) teacher-prepared single sheets, 4) commercially published picture charts, and 5) commercially published readiness books.

6. Skills considered important to the kindergarten readiness program in order of their importance are: 1) listening skills, 2) following directions, 3) language skills, 4) visual discrimination, 5) auditory discrimination."

The preferences expressed in the 5th and 6th statements above suggest that the readiness program preferred by the population surveyed would be of a rather informal type.

It is well-known that many five-year-olds in Great Britain go far beyond the readiness stage, actually learning to read at this age. McHugh's kindergarten program, which stressed letter knowledge and perception of phonemes, resulted in a higher achievement in reading in the primary grades than that achieved by children who did not have this training. (15)

Those who are opposed to formal readiness instruction in kindergarten often base their objections on the child's visual immaturity, the physical difficulties of handling pages in the readiness workbooks, and the inability to sit still and sustain attention. Many of these objections are met by the materials used in this study: the Houghton Mifflin "readiness big book," which obviates the handling of workbooks, the Listen and Do lessons which hold children's attention, and the "boxes" and plastic objects which call for physical activity and provide a game atmosphere. These materials are not of the highly abstract, verbal nature characteristic of many readiness materials of the past.

The Houghton Mifflin materials were produced partly as an outgrowth of the Denver study. Preliminary reports of this study indicate that development of pre-reading skill in kindergarten resulted in significantly greater reading skill in grade 1. (16) Brzeinski's report makes this statement: "These children who were taught the pilot materials in kindergarten were significantly better readers than those children who began the same method in first grade. The differences reported for the first grade are significant beyond the .01 level of confidence." (17)

Anderson, using the Houghton Mifflin workbooks themselves in kindergarten, found that a group of kindergarten pupils who had mental ages from 52 to 65 months benefited as much as a group that had mental ages from 79 to 92 months. (18)

A study done by Schoepheorster and others (19) found the value of formal readiness work to be greatest for the less able child in kindergarten. This study also used Houghton Mifflin materials.

A report of a study in the kindergartens of Glenview, Illinois, supports the preliminary Denver report. It shows that children responded very favorably to the Houghton Mifflin program in kindergarten, achieved significantly better in first grade than control groups, and read more library books and read them sooner than first grade children in previous years. (20)

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(4) Donald D. Durrell and others, "Success in First Grade Reading," Boston University Journal of Education, Volume 140, Number 3, February, 1958

(5) Robert Dykstra, "Auditory Discrimination Abilities and Beginning Reading Achievement," *Reading Research Quarterly*, Spring, 1966, pp. 5-34

(6) Nicholas J. Silvaroli, "Factors in Predicting Children's Success in First Grade Reading," in *Reading and Inquiry*, Proceedings of the International Reading Association, 1965, pp. 296-298

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(8) Robert Karlin, "The Prediction of Reading Success and Reading Readiness Tests," *Elementary English*, May, 1957, pp. 320-322

(9) Lorene K. Fox, "Building on Children's Eagerness to Read," *Childhood Education*, January, 1962, pp. 215-219

(10) Otto Klineberg, "Life Is Fun in a Smiling, Fair-Skinned World," *Saturday Review*, Vol. 40, No. 7 (1963), pp. 75-77, 87

(11) Association of Childhood Education, Washington, D. C., *Reading in the Kindergarten?*, 1962

(12) Roma Gans, *Common Sense in Reading*, Bobbs-Merrill, 1963, Chapter 4

(13) William D. Sheldon, "Teaching the Very Young to Read," *The Reading Teacher*, December, 1962, pp. 163-69

(14) Theodore Clymer, "New Ventures in the Teaching of Reading," *The National Elementary Principal*, February, 1964, pp. 26-30

(15) Loretta McHugh, *An Evaluation of the Effectiveness of a Planned Kindergarten Program*, Unpublished doctoral dissertation, Boston University, 1959

(16) Denver Public Schools, "Reading Instruction in the Kindergarten," Denver, Colorado Public Schools, November 21, 1962

(17) Joseph E. Brzeinski, "Beginning Reading in Denver," *The Reading Teacher*, Volume 18, Number 1, October, 1964, p. 19

(18) Dorothy Anderson, "A Study to Determine if Children Need a Mental Age of Six Years and Six Months to Learn to Identify Strange Printed Word Forms When They Are Taught to Use Oral Context and the Initial Sound of the Word," Unpublished doctoral dissertation, Colorado State College, 1960

(19) Hugh Schoephoerster, Richard Barnhart and Walter M. Loomer, "The Teaching of Prereading Skills in Kindergarten," *The Reading Teacher*, February, 1966, pp. 352-357

(20) Robert L. Hillerich, "Pre-Reading Skills in Kindergarten: A Second Report," *Elementary School Journal*, Volume 65, Number 6, March, 1965

APPENDIX B

TRADE BOOKS

Name	**Author**	**Publisher**
For grade one		
Big Bug, Little Bug	Jean Berg	Follett
Little Red Hen	Jean Berg	Follett
Wee Little Man	Jean Berg	Follett
The Golden Egg	M. W. Brown	Golden
Home for a Bunny	Margaret W. Brown	Golden
Are You My Mother?	Philip D. Eastman	Random
Have You Seen My Brother?	Elizabeth Guilfoile	Follett
Nobody Listens to Andrew	Elizabeth Guilfoile	Follett
The Funny Baby	Margaret Hillert	Follett
The Three Bears	Margaret Hillert	Follett
The Three Goats	Margaret Hillert	Follett
The Three Pigs	Margaret Hillert	Follett
Come and Have Fun	E. T. Hurd	Harper
Who Will Milk My Cow?	Janet Jackson	Follett
My Own Little House	Merriman B. Kaune	Follett
Tiny's Big Umbrella	Mabel LaRue	Houghton
Tiny Toosey's Birthday	Mabel LaRue	Houghton
Ten Apples Up on Top	Theodore LeSieg	Random
Little Bear's Friends	E. H. Minarik	Harper
Roly Poly Cookie	Sarah Murphey	Follett
Hop on Pop	Dr. Seuss	Random
Little Quack	Ruth Woods	Follett
For grade two		
The Fire Cat	Esther Averill	Harper
Too Many Dogs	R. D. Dupre	Follett
Just Follow Me	P. Erickson	Follett
The Bashful Bear	Earle Goodenow	Follett
Sammy the Seal	Syd Hoff	Harper
Herbie Changed His Mind	Mary J. Leake	Houghton
The Hill That Grew	Esther K. Meeks	Follett
Gertie the Duck	Louis G. Romano	Follett
Plenty of Fish	M. E. Selsam	Harper
Shoes for Angela	Ellen B. Snavely	Follett
Penny	Ruth M. Stringer	Houghton
Mr. Barney's Beard	S. Taylor	Follett

Teaching Suggestions for TOO MANY DOGS

INTRODUCE BOOK - Look at the cover of the book. How many little dogs do you see? What name do we use for little dogs? How many big dogs do you see? The big dog's name is on her collar. Her name rhymes with dolly and begins with the same sound as mice. Can you tell us what it is now? Let's print it on the board and look at it on this card so we won't forget it because we're going to read that name all through the book.

Now let's look at the little dogs again. What are they doing? (Allow time for children to talk about this.) Look at the man and the lady in the doorway. Do they look happy? Why might they be sad? Would you like nine little dogs and one big one in your house? Would Mother and Daddy like them? Do you think there are too many dogs in this house?

Let's look at the title of our new book. Read it to yourself first. Now let's read it out loud to the class. What does that word Too mean? (Good time to show the other to and two and explain that they are homonyms, words that sound alike but have different spelling and meaning.) Now we'll turn to our title page and read the title again. Look at the picture on the title page. How many dogs do you see? What kind of dogs are they? Were the dogs on the cover the same kind? Now read your title. Do you think two dogs are too many dogs? Which picture goes with the title - the one on the cover or the one on the title page? What else does the title page tell you? (author, illustrator, publisher)

THREE RULES FOR EACH PAGE

1. Set the scene by studying the picture. Let the children talk about it, particularly if they are weak in oral language.
2. Always have the children read silently with a definite purpose in mind.
3. Let children read orally to show their understanding. Vary the kind of oral reading. Let them read what someone said, the part that shows Mr. White was unhappy, etc.

Page 5

Introduce new words using the Houghton Mifflin method. Use beginning and final sounds with the context. Do this for each page, excluding any words children may have met in previous trade books they have read.

Agnes
and
Stella's
lived

with
Mr.
Mrs.
White's
together

the
dog (s) ('s)
like (d)
they

all
had
fun
living

Have you seen these two dogs before? What are they doing? Let's find out what their names are. (Write Stella and Agnes on the board and on cards.) Does everyone look happy in the picture?

1. Read the first sentence to yourself and find out the name of the people with whom the dogs lived. Read just the name of the people. Read just the names of the dogs.
2. Read the rest of the page and find out how the dogs and the people felt about each other. Read the two sentences that tell how the dogs felt about Mr. and Mrs. White. Read the sentence that tells how Mr. and Mrs. White felt about the dogs. Was this a happy home? Were there too many dogs?

Page 6

gave
good
food
time
play (ed) (ing)
them
there
was
room
for
of
in
house

1. Read the first sentence to yourself and find out how Mrs. White kept the dogs happy.
2. Read the next sentence to find out what Mr. White did to make the two dogs happy.
3. Finish the page and find out what they all had. Read out loud the sentence that tells you. Read the sentence that tells that the house was big enough for all of them.

Page 7

then
one
morning
brought
friend
home (s)
breakfast

Study the picture
1. Read this page to yourself to find out why Agnes and Stella brought a friend home. Read out loud just the two words that tell you.
2. Do you think Mr. and Mrs. White want another dog? Is there room in the house for another one?

Page 8

very
spoke
new
afraid
fed
her
she
thin
to

1. Read the first two sentences and find out two things about the friend. Read us one sentence that tells you.
2. Read the last two sentences to yourself and find out what Mrs. White did for the new dog.

Page 9

ate
neighbor
somewhere
ran
away
pup (s)
at
must
have
look (ed) (ing)
that (')
woods
quickly
said
back

Talk about picture after new words are introduced.

1. Read the first three sentences to yourself and find out what the dog did when Mrs. White put the dish of food on the floor. Read the sentence that tells what she did first, next, and next. (Good time to talk about sequence in a story.)
2. Finish the page and see what Mrs. White's neighbors said about the new dog. Read out loud just the part they said. (Talk about quotation marks around exact words spoken.) What word could you use in place of woods?

Page 10

went
go (ing)
another
found
see
out
old
an
door
two
barn

1. Read the first sentence and find out what Mrs. White, Agnes, and Stella did.
2. Read the next sentence to yourself and find out where Agnes had gone. What word tells us the kind of barn this was?
3. Finish the page and find out how many pups Agnes had in the barn. I see only two pups. Will you read out loud the sentence that proves there were three.

Page 11

after
when
nine
it
were
creek
five
saw
my
more

Be sure children know the meaning of creek before they read this page. (larger than a brook but smaller than a river)

1. Read the first line and find out where that little pup went. Read us just three words that tell you.
2. Read the next two sentences and find out what Mrs. White, Agnes, and Stella did.
3. Read the rest of the page yourself and find out what these pups were doing. Read four words that tell us. Read what Mrs. White said when she saw five more pups. Have they really seen nine pups? (Go back over the pages and note that they have really seen

eight pups but Mrs. White must have seen one that we didn't see.) Let's turn to the next page and find that last pup.

Page 12

his
head
pail
only
tail
hung
hungry

What was that last little puppy doing? What do you think he was trying to find?

1. Read this page to yourself and find out how the nine pups looked. What word tells about the pail ? What two words tell about the pups?

Page 13

took
no
soon
sleep
left
some

1. Read the first sentence to find out what Mrs. White did with the pups.
2. Finish the page and see how much food the pups ate. What did they do after they ate all the food? Let's put things in order according to how they happened on this page. What happened first? Next? Next? etc. Write the stories on the board as the children give you the sequence. Then ask the children to turn to the next page and see what happened when Mr. White came home.

Page 14

came
Molly
collar
owns
many
twelve
be
say (s)
find
hunting
too
name
mother
who
we

How many dogs do the Whites have now? Let's count and see. How many dogs did they have at first? How many new ones have they? How many new ones are little? How many new ones are big?

1. Read the first five lines and find out what Mr. White said they must do. Did Mr. White think there were more dogs than they wanted to take care of? Read the sentence that tells you. Read the sentence that tells what kind of dogs these are. Now read us the sentence that tells what Mr. White thinks they must do.
2. Finish this page and be ready to tell us how they found the dog's name. Read the sentence that tells where Mr. White looked. Now read us the sentence that tells us the dog's name.

Page 15

is
butcher
big (ger)
get
bones
meal
got
gone
box
bag
store
from

Study picture. Do Mr. and Mrs. White look happy? Why? Those twelve dogs are eating a lot of food, aren't they?

1. Read the first two sentences and find out what Mrs. White said when she noticed that both bags of dog food were empty. What does it say on those bags? Let's make a bag on the board and write those words right side up. Now can you read it? Read us just the sentence that tells what Mrs. White said about the dog food. Now read the sentence that tells what they must do.
2. Read the next sentence and find out where they went. Read out loud just the three words that tell where they went.
3. Finish the page and be ready to tell what two kinds of food they got for the twelve dogs. Read the sentence that tells one thing they got. Now read aloud the sentence that tells what they got at the butcher's. (Be sure children know what a butcher is and what he does.)

Page 16

put
ad
paper

Be sure children realize that ad is just a short way of saying advertisement and is different from add.
Where are Mr. and Mrs. White? Have they bought very much dog food? How do you know they have bought a lot of it? Can you read the sign the grocer has put on the counter? Read it to us. Can you read any other words in the picture? What is another word we could use when talking about apples and pears?

1. Read the first sentence and find out what else the Whites did.
2. Read the last sentence and see what the ad said. Why is that word FOUND written in big capital letters? How will you read that word? What word tells the kind of dog that was found? Read out loud just the ad.

Page 17

just
not
even
did
he
lost
days
few
happy

Look at the picture. Can you think of one word that describes how the big dog and all nine pups look? Why should they feel happy or contented?

1. Read the first sentence and find out just how long all that dog meal lasted. Read out loud just four words that tell.
2. Read the next two sentences and find out how the dogs did *not* look.
3. Read the next sentence and find out how they *did* look.
4. Read the last sentence and see if anyone came to claim the dogs.

Page 18

owner please call

Look at the picture. How do the Whites look? What makes them look so tired? Is that a bigger bag of meal that Mr. White is carrying? Let's check back to page 16 and see. What tells you that it is very heavy? What is Mrs. White carrying? Where would she get bones?

1. Read the first sentence and find out what tells you that bag of meal is very heavy. Read out loud just the words that tell you.
2. Read the next sentence and find out what they got at the butcher's.
3. Finish the page and see what they put on the end of the new ad. Why is PLEASE in big capital letters? Read the ad to us.

Page 19

grew

We know that Mr. and Mrs. White weren't happy about Molly and her nine pups.

1. Read this page to yourself and find out who else was not happy. Find a word that tells what the pups did. Find two words that tell what kind of dogs they were now.

Page 20

always place three

1. Read this page to yourself and find out why Agnes and Stella were not happy. Read out loud the sentence that tells why Agnes was not happy. Now read the sentence that tells why Stella was not happy.

Page 21

four curl chair

Does Mr. White look happy in this picture? Can you guess why?

1. Read this page to yourself and find out why both he and Mrs. White were not happy.

Page 22

dig garden

Can you find another reason why Mrs. White was not happy?

1. Read and see if you were right. What did Molly do that made Mrs. White unhappy? Read out loud the sentence that told you.

Page 23

weeks
ten
by
bill
yes

How does Mr. White look in this picture? Why should he be so angry? Would your Daddy be angry with all those dogs in your house?

1. Read the first sentence and see how long a time the Whites had the dogs.
2. Read the second sentence and find out how much they ate. What would make them eat more and more?
3. The next sentence is going to tell us why Mr. White looks so angry. Read and see if we were right.
4. Finish the page and see what Mr. and Mrs. White have decided to do with Molly and her pups. Read out loud just the sentence that tells how many dogs too many they have. Which dogs are they going to keep? Why? What will they do with Molly and her pups? What would your Mother and Daddy do? What would you do? Let's see what they're going to do.

Page 24

next
car
where
sale

Look at the picture. Where are Molly and her pups now? Why do the people look so surprised? Where do you think they are going?

1. Read this page and see where they are really going. Read out loud the sentence that tells you.

Page 25

farmers
pigs
horses
sheep
cows
sell

1. Read this page to yourself and see what kinds of animals were being sold. Read us the sentence that tells what kind of people were there. Read the two sentences that tell what kind of animals the farmers had to sell. Read the sentence that tells what Mrs. White had to sell. Read the sign that tells you.

Page 26

fine
wanted
wagged
buy
their
everyone

Talk about this picture. Do you think they will be able to see Molly and her pups?

1. Read this page and find out if anyone wanted to buy the dogs. Read out loud a sentence that tells how they looked. Read a sentence that tells what they did. Read a sentence that tells whether or not they wanted to buy a dog. What two words in the last sentence tell about Molly and her pups?

Page 27

boy father sold before

1. Read the first sentence and find out which dogs a boy and his father bought.
2. The last sentence will tell you when they sold all the other dogs.

Page 28

hot cakes

Mrs. White went home to Mr. White and Agnes and Stella. We can really see how little their house is in this picture, can't we? This page has a big joke on it.

1. Read this page and when you find the big joke put your hand over your mouth so no one can hear you laughing. Who can read us just the part of the page that tells the joke? What do we mean when we say that they went like "hot cakes"? In this case, they weren't hot cakes, were they? What were they?

Page 29

sat down

How do the Whites look in this picture? What about Agnes and Stella?

1. Read this page to yourself and see if everyone is happy. Mrs. White was really happy. Find out why.

****

Reread this book many times. It lends itself well to dramatization and will make the children realize the change of moods that will make for more understanding of stories they read.

Let the children make their own storybook and place one on the reading table so they can take it and read to Mother and Daddy. This will be a big accomplishment for them. They could make a collection of dog pictures and label the kind of dog each one is. They could also write a story about each kind of dog and put these pages together into a booklet of their own or one for the whole class to read.

They could also make a collection of other animals showing both mother and babies. Here, again, they could make a collection that could be placed in a book and stories written about each kind of animal.

SKILLS COVERED

1. Beginning consonant sounds. Reinforce with plastic articles, picture cards, and letter shapes.

2. Beginning digraphs - th-wh-sh-ch-

the	White	sheep	chair
they	when		
them	where		
there			
that			

Children should be alerted to the fact that the same sounds are found in the middle or at the end of words such as another, butcher, somewhere, mother, and father.

3. Consonant blends can also occur at the beginning, in the middle, and at the end of words

Stella	store	
Play	Please	place
friend	middle sound in afraid	
brought	breakfast	
creek		
sleep		
twelve		
grew	middle sound in hungry	

Just to make them listen for these blends is enough at the present time. Always show them the letters that make the sound whenever they hear it.

4. Listen for final consonants and substitute whenever possible. Let them see you erase one letter and put in another. Had can become ham and then hat. This is also a clue they can use when unlocking a new word.

5. Following sequence is a very important skill in this book. List events on the board by page and then use the whole book in this way when it has been completed. Ask, "What happened first in the story?" (Write it on chart or board.) What happened next? Continue until all main ideas are covered.

6. Endings are listed in the vocabulary lists. Make sure children understand why ed, s, 's, and ing are added to the root words. Make sentences using these endings.

7. Whenever possible, give children a chance to find an antonym for a word. Words such as thin and fat, back and forth.

8. Give synonyms whenever possible. What is another word for woods? (forest) creek? (stream) etc.

9. Long and short sound of oo. Sound as in good and food. Have children note the difference.

10. Classifying: things we eat, kinds of fruit, kinds of furniture, etc.

11. Main ideas. Go back over each page. Have the children read the whole page silently and tell you in one sentence what the whole page was about. Be sure they give a complete sentence. Example: Page 15. After that page is read silently, the children could say: "Mr. and Mrs. White had to buy more food." Get as many variations as you can from different children.

APPENDIX C

GATES WORD PRONUNCIATION TEST

EXAMINER'S COPY

DIRECTIONS: Have the child read the words out loud. Tell him you would like him to read some words for you. If he fails the first time, ask him to try the word again. Continue until ten consecutive words have been missed. As the words become difficult, special care should be taken to encourage the child. The score is one point for each word correctly pronounced on the first trial, one-half point for each word correctly pronounced on the second trial. (Note: 9½ correct would be scored as 10.)

---

1. so
2. we
3. as
4. go
5. the
6. not
7. how
8. may
9. king
10. here
11. grow
12. late
13. every
14. about
15. paper
16. blind
17. window
18. family
19. perhaps
20. plaster
21. passenger
22. wander
23. interest
24. chocolate
25. dispute
26. portion
27. conductor
28. brightness
29. intelligent
30. construct
31. position
32. profitable
33. irregular
34. schoolmaster
35. lamentation
36. community
37. satisfactory
38. illustrious
39. superstition
40. affectionate

Child's name: ______________________ Test date: ____________

Examiner: _________________________ Birth date: ____________

Age: ________________

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TEST OF ABILITY WITH HOUGHTON MIFFLIN METHOD OF WORD ATTACK

Directions: Examiner will read the sentence from the paper stopping at blank space. He will hold up card on which test word has been lettered. Child will pronounce the word if he is able. Examiner will then ask two questions, marking the answer chart as she asks each one.

Example: The boy fell down in the ________.
mud make water

Hold up card with mud on it. Child responds. Examiner then asks:

1. Why wasn't the word make? (Does not make sense. Sounds funny.)
2. Why wasn't the word water? (Does not begin with right sound.)

---

1. Yesterday Tommy was stung by a ______.
bee boy wasp

2. Put your toys in the box when you are ______.
done dime through

3. Before I go to bed I like to have a drink of ______.
water wish milk

4. Janet helped mother hang out the _____.
wash clothes wish

5. Wipe your face on the _____.
towel tall cloth

6. I know where Betty has ______.
gone hidden gown

7. I never saw you wear that dress before. Is it ______?
new now yours

8. My teacher took our class to the zoo. We went on the _____.
bus bag train

9. Mother made this sweater out of ______.
yarn yellow wool

10. There was mud on the dog's _____.
paw foot pie

11. We all like peanut butter. We buy it in a big _____.
jar jump glass

12. The hunter killed the lion with one _____.
shot bullet shout

AN INVENTORY OF READING ATTITUDE

Standardization Edition

Name ______________________________ Grade ________ Boy Girl
Last First Middle

School ______________________ Teacher __________________

Date of Test ____________________
Mo. Day Yr.

TO BOYS AND GIRLS:

This sheet has some questions about reading which can be answered YES or NO. Your answers will show what you usually think about reading. After each question is read to you, circle your answer.

INSTRUCTIONS TO PUPILS

Draw a circle around the word YES or NO, whichever shows your answer.

Sample A

Yes	No	Do you like to read?

If you like to read, you should have drawn a circle around the word YES in Sample A; if you do not like to read, you should have drawn a circle around the word NO.

Sample B

Yes	No	Do you read as well as you would like to?

If you read as well as you would like to, you should have drawn a circle around the word YES in Sample B; if not, you should have drawn a circle around the word NO.

Yes No 1. Do you like to read before you go to bed?

Yes No 2. Do you think that you are a poor reader?

Yes No 3. Are you interested in what other people read?

Yes No 4. Do you like to read when your mother and dad are reading?

Yes No 5. Is reading your favorite subject at school?

Yes No 6. If you could do anything you wanted to do, would reading be one of the things you would choose to do?

Yes No 7. Do you think that you are a good reader for your age?

Yes No 8. Do you like to read catalogues?

Yes No 9. Do you think that most things are more fun than reading?

Yes No 10. Do you like to read aloud for other children at school?

Yes No 11. Do you think reading recipes is fun?

Yes No 12. Do you like to tell stories?

Yes No 13. Do you like to read the newspaper?

Yes No 14. Do you like to read all kinds of books at school?

Yes No 15. Do you like to answer questions about things you have read?

Yes No 16. Do you think it is a waste of time to make rhymes with words?

Yes No 17. Do you like to talk about books you have read?

Yes No 18. Does reading make you feel good?

Yes No 19. Do you feel that reading time is the best part of the school day?

Yes No. 20. Do you find it hard to write about what you have read?

Yes No 21. Would you like to have more books to read?

Yes No 22. Do you like to read hard books?

Yes No 23. Do you think that there are many beautiful words in poems?

Yes No 24. Do you like to act out stories that you have read in books?

Yes No 25. Do you like to take reading tests?

Supt. of Schools, Dept. of Educ.

San Diego County 2-61

SPRINGFIELD PUBLIC SCHOOLS
Springfield, Massachusetts

1. Do you like to read before you go to bed? Yes No

2. Do you like to go to the library and take books home to read? Yes No

3. Do you think that most things are more fun than reading? Yes No

4. Do you like to read a book when your other work is finished? Yes No

5. Do you like to read out loud to the other children in your group? Yes No

6. Would you like to read books that had no pictures in them? Yes No

7. Do you think you are wasting time when you read? Yes No

8. Do you like to listen to stories when your teacher reads? Yes No

9. Do you like to take work papers back to your seat after your group has read? Yes No

10..Do you like to talk about pictures and stories? Yes No

11. Do you like to write stories of your own? Yes No

12. Do you like reading better than anything else in school? Yes No

13. Do you like to figure out new words when you see them? Yes No

14. Do you like to pretend you are someone else and read a part in the story? Yes No

15. Do you like to take reading tests? Yes No

16. Do you like to read stories if the words get hard? Yes No

Adaptation of San Diego Inventory
(compare pages 141-142)

INFORMAL TEST OF VISUAL DISCRIMINATION

Give the pupils only page 1 of this test.

Say to the children:

> We are going to look for pictures that are the same. Put your marker under the first line of pictures. Now look at the first picture way over here on the left. (Indicate with your own copy just where they are to look.) Now, with your eyes, look at the next picture. Is it the same as the first one? No, it isn't. Let's look at the next picture. Is this one like the first one? That's right. It is just like the first one so let's put a big red cross on this picture. Now put your marker under the next row of pictures. Look carefully at the first picture and then look across just that line until you find a picture that is just like the first one. Can you find it? Put a red cross on it when you do. Now put your red crayon down. Listen! We are going to do the same thing with each row. Look at the first picture, find the one that is just like the first one and put a red cross on it. All ready -- Begin -- (Allow ten minutes **for** them to complete this page. Then have crayons put inside the desk.

Now give the pupils page 2 of the test.

Say to the children:

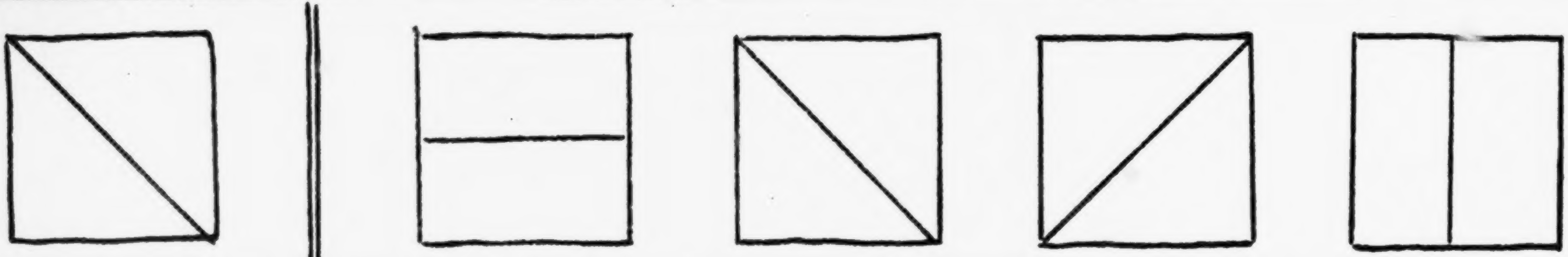
> We are really doing the same thing on this page only now we are looking at letters instead of pictures. Look at the first box of letters way over here on the left. (Indicate with your own paper just where they should be looking.) Look carefully at the letters. Now look across the line and find three more letters that are just like these first three. When you find them put your finger on them.

Check carefully to make sure all children know what is being done and have their fingers on the correct group of letters. Then let them do this page in the same way they did page 1. Allow ten minutes for this test and then have crayons put inside the desk.

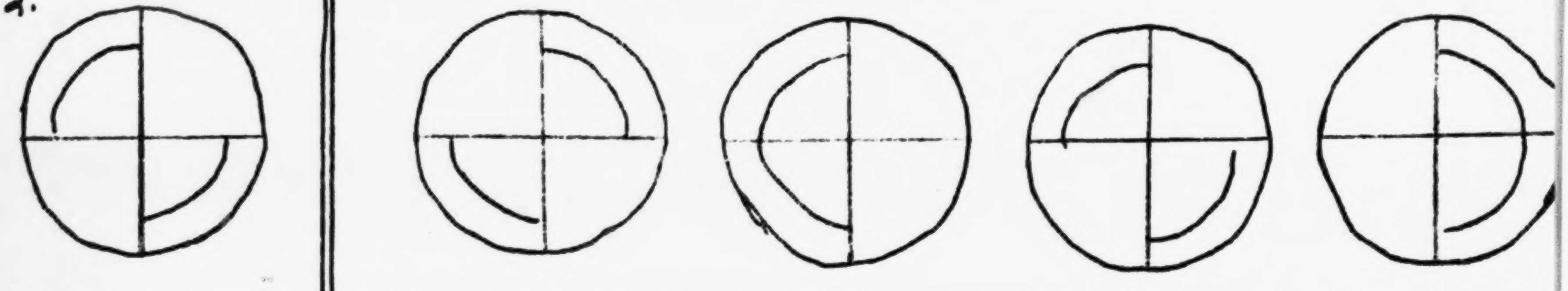
Teachers should fill in name, etc., prior to the testing period. Be sure children are seated so that copying will be kept to a minimum.

Name Date

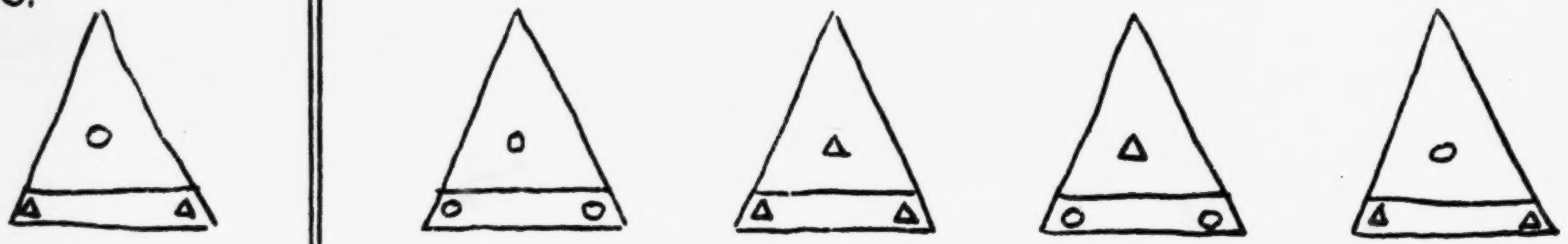
1.



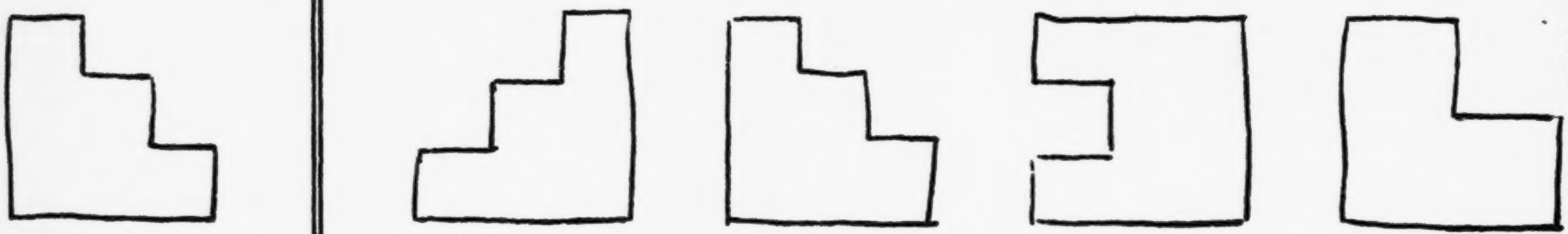
2.



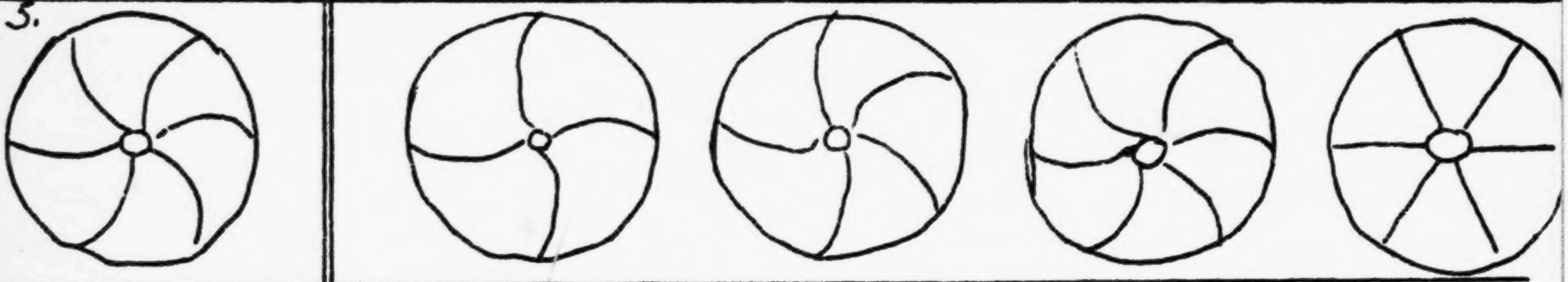
3.



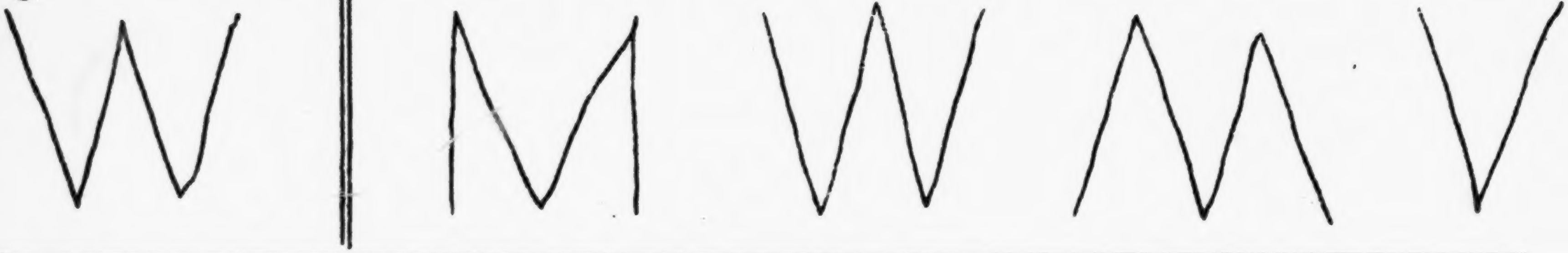
4.



5.



6.



School Teacher

Name- Date-

TBP	TPB	BPT	TBP
TOVS	TOSV	VOST	TOVS
boy	bag	boy	day
house	have	house	horse
goat	boat	got	goat
water	woret	wrate	water
play	paly	play	pyal
soft	soft	sotf	sfot
kitten	mitten	kite	kitten
table	marble	table	tale

School- Teacher-